

Year in Reviews Predicting the M-Market

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# MASTERING

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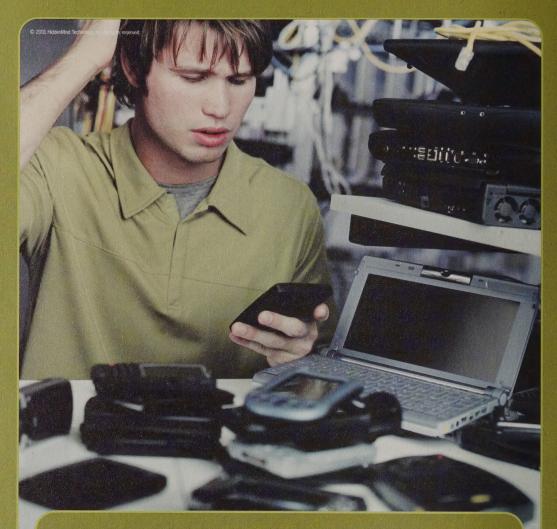
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BEHIND THE NEWS

FIRST GPRS ROLLOUTS • GOODBYE, SPECTRUM CAPS



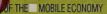
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Foretelling a young market's future is notoriously hard. but that makes it all the more important.



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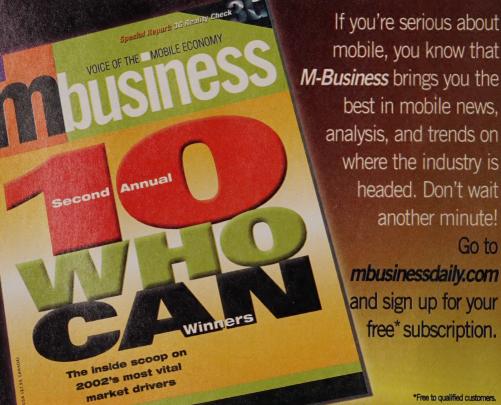
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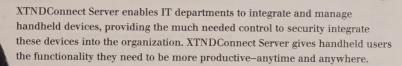
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WILL WIRELESS CHECK-IN STILL FLY? p. 55

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## M-Commerce ≠ M-Transactions

DEAR M-BUSINESS: The PCIA disagrees with Mo Marshall that carriers will not profit from wireless Web offerings if they follow an "all you can eat" model ("1s the Wireless Web around the Corner?" Front Lines, October 2001). Her point that messaging, m-commerce, and m-transactions are usage-based revenue generators is off the mark. Messaging is a connectivity offering. It's based on a critical mass of users paying for minutes or transported text — hence, it is usage based. M-commerce and remote transacting are entirely different animals.

Users on an all-the-minutes-you-caneat plan can drive significant
revenue to the operator, if
that operator is positioned to
take advantage of the true value
of the mobile transaction. Can
the operator derive a percentage
of the transaction value, for access?
Can it handle billing and customer
care for a fee? Has it developed advertising agreements and consumerprofiling opportunities with the content
provider?

Furthermore, mobile users — especially in the U.S. — have very selective tastes when it comes to mobile products and services, so carriers need to understand the mobile user. Right now, the industry is throwing services to consumers based on what the technology can do, not based on what consumers really want.

PCIA conducted market research of nearly 5,000 mobile users around the world and found that the usage of and interest in mobile services — whether they're transaction, information, or entertainment in nature — vary substantially by country, by gender, and by age.

With this data, each company trying to position itself along the m-value chain will be able to target the highest ROI user segment in the country that they are focusing on. So whether it's the savviest consumer, the occasional user, or the enterprise user, the market rules.

Jay Kitchen President and CEO, Personal Communications Industry Assn. Alexandria, Va.

## Where's Nokia?

DEAR M-BUSINESS: I found it ironic that your November 2001 issue's "10 Who Can" article on who will drive the wireless data market in 2002 arrived on the same day that Nokia announced a formation of the largest worldwide consortium to date, to do just that.

You can understand my surprise at leafing through the article several times

and wondering if the page on Nokia was missing from my issue.

So, you are saying that the company with the world's fifth-best-known consumer brand, which owns roughly 40%

of the worldwide termi-

nal and infrastructure business, and which has just formed the aforementioned consortium, isn't included?

Either you left pages out of my copy or you committed one of the biggest errors of omission I've seen. Which is it?

> John M. Vito Senior Partner, Phoenix Wireless Consulting Group Lisle, Ill.

Editors' response: No pages were missing from your copy. We're glad Nokia formed this consortium, but such industry standards groups often don't accomplish much. More intriguing to us is Nokia's mid-November decision to try to create a standard device platform to rival those of Microsoft and Palm – that could change the rules or simply distract Nokia from its current business. We think 2003 will be more telling.

## What Data Services Need

DEAR M-BUSINESS: It's not that carriers are not investing in the front-end infrastructure for data services ("Will 'Front-End' Infrastructure Get Carriers Moving?" Front Lines, November 2001). Several of them have conducted field trials and/or invested in platforms, content, and applications. The issue is that they have met with limited success to date, largely because of the user interface problems associated with the Wireless Application Protocol (WAP) and with dial-up access.

We believe a new user interface is needed to unlock the true potential of the market for wireless data and enhanced services. We further believe that the eventual owners of the wireless data market will be the carriers because of their unique billing, location-aware, and calling-pattern knowledge of the wireless user. And finally, we believe the U.S., although lagging today, will catch up and deploy advanced technologies to offer data services in this huge market.

Implementing the mobile virtual network operator (MVNO) model is fraught with complexities and conflicts of interest. So it will be several years before we see large-scale MVNOs in operation, giving carriers ample time to sort out current issues and pursue the data market.

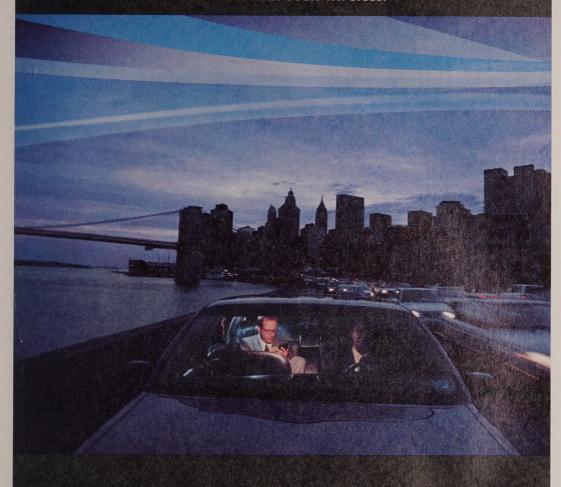
Arvind Rao CEO, OnMobile Systems Los Altos. Calif.

#### Corrections

In the November 2001 issue's "10 Who Can" cover story, we gave an incorrect URL and staffing figure for Nextel Communications. The company's URL is www.nextel.com, and the number of employees is 17,000. Also, most developers for Nextel's service program in Java and the Wireless Application Protocol (WAP), not in C++ as we indicated.

We regret the errors.

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# **Is Unified Text Messaging Here?**

At issue: AT&T Wireless announced in late November that, with the services of InphoMatch, it would let its customers easily send text messages to people who were using other carriers' wireless plans. Typically, sending messages across carriers — when it's possible — involves complex addressing. Does AT&T's move mean that the other carriers will follow suit and open up a messaging tide for companies to take advantage of?

GALEN SAYS: No. I agree with Cahners In-Stat Group analyst Don Longueuil that the walled garden remains the preferred strategy. A carrier still has more to gain by pressuring people to sign up for its own services than by facilitating interactions between its customers and those of other carriers — especially because such facilitation would cost a carrier money. Carriers also don't want to share text-messaging revenue with others, and they don't want to have an extra-cost "roaming" service for intercarrier messaging, as

that would alienate customers who wouldn't be sure if the intended recipient was a fellow customer or not.

I agree that the carriers' interest doesn't match the users', but I understand that for the carriers, messaging is not a big priority right now. Rolling out new data services and finding valueadded, extra-cost services is.

You might argue that in Europe and other regions (including our neighbor Canada), message interoperability is considered normal and that it has facilitated a booming messaging environment on which companies are now trying to build businesses. But those areas typically share a common technology standard — GSM's Short Message Service (SMS) — so interoperability is easy and cheap. Not so in the U.S., where each carrier has a different messaging technology.

The U.S. has another burden: Americans email each other, and they've made instant messaging another part of the communications culture. We don't need text messaging like the email-deprived Europeans did. The Research in Motion BlackBerry is a great example. And people love it. Instant messaging in which the phone is simply another client to the familiar desktop technology will have the same success. Companies like America Online have already started setting up the necessary infrastructure for that.

When mobile messaging in the U.S. does come of age, it'll be because someone has figured out how to make cell phones and wireless PDAs clients to existing email systems — essentially, a standardized, Internet-like system that doesn't care what the client is or which carrier connects that client.

MO SAYS: Yes, it may not be in the carriers' short-term interests, but it's clear from Europe and Asia that messaging — whether email, SMS, instant messaging, or other format — will gain strong consumer adoption, and people won't put up for walled gardens on such a basic method of exchange. The sooner the carriers acknowledge this, the faster the market can blossom.

I think you underestimate the pressure that interoperability moves like AT&T's and the Canadian carriers' will create for the other carriers. People don't like being limited, and when AT&T Wireless customers start sending their friends text messages merely by entering their phone numbers – rather than the now-required phone number plus carrier address – and

those friends using other carriers find out they can't simply reply, that'll create demand that should force other carriers to follow suit. Remember, reducing churn is a big concern of the carriers, and messaging roadblocks could increase churn.

I'm also not convinced by your argument that Americans will choose email over text messaging. Certainly,

I won't contest the benefits of email access for enterprise users. But remember that wireless uptake is projected to significantly outpenetrate Internet uptake in the next few years. This means we'll have large numbers of mobile users who (1) may not have an email account, (2) may not want to go through the extra steps of accessing that account frequently while on the go, and (3) probably don't want to access a channel that's rampant with spam when they're paying to wade through it. For these users, text messaging presents a simple, always available option that, presumably, will be kept relatively spam-free by the carriers.

Finally, to your point on instant messaging: IM has been popular for quite a while, but there's little interoperability now among IM systems. Uniformity across IM systems in the mobile space certainly won't progress quickly enough for carriers and users to skip the step of text-messaging interoperability.

Each issue, Editor in Chief Mo Marshall and Editor Galen Gruman debate a key mobile strategy question. Send us your views at letters@mbusinessdaily.com



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Clemens Kaiser, Head of eCommerce, Bayer, October 2001

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Bruce Richardson, AMR Research, October 5, 2001

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New York Times, October 1, 2001

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# **GPRS Gets the Jump on Everyone**

PRS really snuck up on us," our senior editor says. Poised at the beginning of 2002, expected to be the year of 2.5G, we're discussing whether, for once, a wireless promise will materialize. And to our surprise, this editor is evangelical in his enthusiasm.

We're a pretty skeptical bunch - wary and weary of

the endless unrealized promises of wireless technology – so we're taken aback. But he presses on. A flash flood of network deployments in late 2001 puts General Packet Radio Service (GPRS) several months ahead of CDMA2000, this year's other notquite-3G rollout. And it's here – a workable, working 2.5G service that many enterprises can take advantage of now.

"There's a bigger commitment from carriers than I expected this early," our staff writer allows.

We've very quickly gone from piloting this in a couple of cities to real rollouts around the country. Our evangelist predicts a snowball effect, and he says the lack of full-blown hyperbole means enterprises will hardly see it coming.

"The carriers are announcing the rollouts," the senior editor explains, "but they're not trumpeting them, probably for fear of the kind of backlash that killed WAP."

Hype: We don't miss it until it's gone.

#### **EVOLUTION AIN'T INSTANT**

Sure, GPRS isn't finished. The whole nation isn't served, and the new devices and services we'd like to see haven't materialized, but our features editor jumps in to argue for the immediate benefits: "No dial-up, no drop-off," he says. "And the reliability of packet data — that's compelling."

"And service at 20Kbps-40Kbps," the senior editor adds. "All that's going to get the snowball rolling."

Now, about the device problem: For starters, you could probably hold all the GPRS phones on the U.S. market in one hand, and none of them are what you'd call hypnotically fascinating. And since the user base isn't there, manufacturers have no incentive right now to bring out new GPRS handsets.

While we decry Motorola's Timeport GPRS series as not really being data-oriented – for not being *exciting*, frankly – we can't help appreciating the effort. "At least Motorola takes the risk," our editor notes. "Probably to try to make up for losing market share."

And there's VoiceStream, the carrier pushing the most aggressive GPRS rollout – another second-tier company trying to make a play by running fast with 2.5G. But it's not all second-tier companies on the front lines: Two of the biggest carriers, AT&T Wireless and Cingular Wireless, are adding new cities every few weeks

to their GPRS systems.

And we're waiting for services to emerge. In Europe, they're plugging GPRS phones in to laptops to serve as fast wireless modems, a use that VoiceStream and others champion in the U.S. It's not thrilling, our editor allows, but it's smart. "It takes the existing user base and focuses

it on the new delivery channel," he says. "There are some logical first steps being taken without a lot of hype."

#### READY TO GO?

The actual carrier effort, as opposed to the theoretical commitment of the past two years, means businesses can take advantage of the carriers' 2.5G moves despite the down economy. Some will need to wait for nationwide

coverage or specific services and handsets, but others will find the surfing good even before the wave crests.

"Enterprises are used to being oversold," our editor

in chief notes. She's among those of us who aren't so sure that this 2.5G tide has rolled in quite yet, but she agrees that, for once, every incremental gain isn't being hyped to death. "Enterprises have to prepare not to be overwhelmed. To investigate the possibilities."

"If you're a business waiting for trumpets to blare, you're going to miss early opportunities," our undaunted senior editor says. "Nobody's going to come up and shake you."

Despite our quibbles over what carriers and handset makers should be doing, we realize there's a fundamental shift in how we're discussing GPRS. It's no longer in future tense. It's happening now, and enterprises should be investigating their options. For once, the skepticism reflex is unwarranted. "It would be nice to be positive for once," our senior writer laughs.

- Brian McDonough

Each issue, the M-Business editorial staff puts its collective wisdom on the line to predict the wireless future. If you think you know better, email us at letters@mbusinessdaily.com.



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Mobile and Wireless Solutions

# **NEWS** currents

#### market currents

# Palm Still Flounders, CEO Resigns



Palm CEO Carl Yankowski resigned in November, as the company was preparing to split into hardware and OS businesses. Palm, creator of the PDA market and once its innovative leader, stagnated in 2001. The company has been caught in a cash squeeze as demand for Palm products has plummeted - and prices along with it - even as Microsoft and Research in Motion make significant gains. In November, Handspring turned its attention more visibly to the enterprise market, giving Palm renewed competition on its own platform.

Palm hasn't given up, of course: Even as Yankowski was leaving, Palm was preparing to launch a major advertising thrust led by TV spots highlighting such uses of Palm products as accessing news, maps, and games.

## More Email Reaching More Mobile Users

Several companies have recently announced initiatives that extend mobile email options:

- Internet service provider EarthLink will include access to EarthLink email in its version of Research in Motion's BlackBerry service.
- RIM announced that wireless carrier VoiceStream would deploy the BlackBerry service and sell the RIM devices.
- In the U.K., Vodafone announced a deal with IBM that was to bring its wireless customers access to Lotus Notes, a favorite email program among corporate users.

# Qualcomm, Globalstar to Listen In on Aircraft

Qualcomm and Globalstar are developing a satellitebased system of monitoring planes that will allow realtime transmission to air controllers of airline cockpit conversations, plus video of passengers and other data, according to the *Wall Street Journal*. The technology could enhance inflight security and ease fears in the wake of the Sept. 11 terrorist attacks.

## Aerie Networks Hits Metricom Yard Sale

In November, Aerie Networks bought the remaining assets from Metricom's failed \$1 billion high-speed wireless network for \$8.3 million. Aerie is considering rebooting part of the collapsed Ricochet network, with California and Colorado cited as top possibilities for its coverage areas.

The company says it wants to let city governments sell the service to such businesses as utilities. That's once Aerie is able to get past the cost of starting the network up again.

## Anticipating Mobile Media Streaming

Mobile media streaming will offer many applications — information, adult entertainment, and communication services — but a slow rollout of third-generation (36) networks and video-enabled device development will keep users waiting until 2005 for initial services. Even by 2007, it will comprise only 1% of all mobile service revenues.

2005: \$1.0 billion 2007: \$7.8 billion

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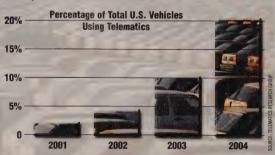
# Best Western, Fairmont Unwire

The Best Western hotel chain says that it will expand its Internet functionality to permit wireless access. PDAs, pagers, and data-enabled cell phones will be able to search for hotel locations, confirm reservations, and click through to a toll-free reservation hotline.

Meanwhile, Fairmont Hotels and Resorts, one of North America's largest owner/operators of luxury hotels and resorts, is outfitting all 37 of its properties with high-speed wired and wireless Internet access for use by hotel guests in their rooms and in public meeting areas.

#### **Telematics Growth to Sharply Accelerate**

The nascent embedded telematics market — which offers wireless Internet-like services in cars — will have almost 100% annual growth rate, according to forecasts from Telematic Research Group. Users will create demand because of security and remote diagnostics features, while manufacturers will take advantage of the platform for subscription-based content services.



### technology currents

# Canada Moves on SMS Interoperability

Canada's four wireless communications providers — Bell Mobility, Microcell Connexions, Rogers AT&T Wireless, and Telus Mobility — are

#### form factor

#### A Palm on Your Wrist

Fossil's wrist PDA and Wrist PDA/PC holds contacts, memos, and appointments, beamed from Palm OS and Pocket PC PDAs via an infrared port. The device's 190K, which can be updated only via the infrared link, lets PDA users carry a small selection of their PDA's contact information — enough for about 20 electronic business cards. Both models cost \$145. And yes, it also tells the time. —Eileen Parks



developing intercarrier mobile text messaging for digital wireless customers across Canada. Such interoperability would be a North American first and would tackle one of the most frequently cited barriers to widespread Short Message Service (SMS) adoption in North America.

# Bluetooth Devices Begin to Appear

The research firm ARC Group has predicted that the number of Bluetooth-enabled mobile handsets will rise dramatically, from 1.3 million in 2001 to 98.3 million in 2003. Some signs of how that will happen:

- Red-M announced a Bluetooth module for the Handspring Visor. The \$179 Red-M Blade slides into the Visor's Springboard expansion slot, letting the Visor connect with other Bluetoothenabled devices.
- The new Sony Ericsson Mobile Communications joint venture released a wearable accessory for Bluetooth handsets. The \$200 Bluetooth Handsfree HBH-20 accessory is about half the size of a credit card and can be clipped

onto a shirt, slipped into a pocket, or worn on a chain around one's neck. A wire connects to a separate earpiece unit. Motorola has a similar product.

• The Bluetooth Special Interest Group gave Microsoft qualification for the upcoming Windows CE.net mobile OS release, which will be Bluetooth compatible.

Less than a month before that qualification was announced, Microsoft released its new desktop platform Windows XP, for which Bluetooth compatibility had been previously announced. Windows XP was released without Bluetooth functionality, however.

# Air2LAN Launches Mobile Broadband

Air2LAN has launched a mobile broadband Internet service that would give laptops and PDAs wireless connections at 11Mbps. Venues for the service are expected to include corporate office complexes, restaurants, coffeehouses, and airports.

The company said that the 802.11b service lets users browse the Internet and respond to email without restrictions or costly airtime fees. The service will be available to existing Air2LAN subscribers, but the company says it will also let transient users casually surf the Internet, download music, or communicate with colleagues and friends in public locations.

# Mercedes-Benz Debuts Hot Spots

Mercedes-Benz unveiled its telematics research car at the Comdex expo in November. The C320 sedan's broadband telematics system lets high volumes of wireless data be transmitted in a few seconds The company is pushing a service, called DriveBy InfoFueling, that would rely on a short burst of data as the vehicle drives by a high-bandwidth transceiver along the roadside. Such hot-spot technology would replace a continuous cellular-type connection for all but voice and automatic emergency notification.

The "sometime, somewhere" paradigm is meant to make such consumer conveniences as digital video, music, traffic reports, and map updates less expensive.

# Gaiacomm Chases 4G Heater/Antenna

With third-generation (3G) wireless technology still shimmering miragelike in the distance, newborn R&D firm Gaiacomm says it's going to build a 4G prototype. The heater/antenna telecommunications system will come loaded with big expectations. The company describes a network of land-based heater/ antennas that enable smart phones, PDAs, laptops, and other wireless devices to experience data-transmission rates up to 29 times faster than that provided by present technology. Plus, the system will boast 100% reliable connections, no

#### Will BREW Outdo Java?

In the next two years, cell phones with wireless internet capabilities will have two competing platforms. Qualcomm's Binary Runtime Environment for Wireless (BREW) and Sun's Java 2 Micro Edition (J2ME). Both have their strengths: Java's been around longer and has a larger developer base; BREW was designed specifically for mobile environments. Research Portal predicts that BREW's impose only platform will soon make it the platform of choice for developers.



# **NEWS** currents

interconnection or roaming charges, no loss of data, and no dropped calls. All this will be seen in a demonstrable prototype in early 2003, the company says.

## Internet CDMA Tested in Korea

Tantivy Communications says its Internet-CDMA (I-CDMA) cellular technology ran successful rural and urban tests in South Korea. The company says its technology provides a peak data throughput of 1.9Mbps, supporting per-user access speeds of 365Kbps for downloading and 222Kbps for uploading data. The technology is meant for use by laptops and other devices that use the TCP/IP protocol.

#### world currents

# NTT DoCoMo Slams Spam

Following thousands of complaints about spam, NTT Do-CoMo says it will spend more than \$8.2 million on spambusting technology. Apart from what users see, there's also the heavy burden on Do-CoMo servers when millions of messages bounce back because the system doesn't recognize the addresses the spammers are messaging.

In October, DoCoMo scored a one-year injunction preventing Web company Global Networks from sending large quantities of unauthorized email to i-mode customers.

# U.K. Mobile Ads' Ups and Downs

Even as British wireless operator BT Cellnet became the first carrier to formally throw its hat into the SMS advertising ring, two firms specializing in wireless marketing collapsed. In October, BT Cellnet announced that it would make a new firm, Enpocket, its sole agent for wireless marketing, starting with a research pilot that ran in November.

As that announcement was being made, ZagMe and Airmedia – both SMS-based marketers – closed their doors. Airmedia had worked with such prestigious clients as Pepsi and Columbia Films.

# Nokia to Blanket China in GPRS

Nokia says that its General Packet Radio Service (GPRS) network in China will cover the whole country. The network, built for China Mobile Communication, will have a subscriber capacity of more than 2 million, according to news portal Ananova. Nokia officials say the network is expected to be up by January 2002.

## Virgin Adds SMS Content Down Under

Virgin Mobile has added SMS information offerings to its mobile phone service in Aus-

# DoCoMo's WAP Service Hits Europe

NTT DoCoMo, with its partner KPN Mobile, will offer Wireless Access Protocol (WAP) services in Europe, giving the often-maligned technology another chance to win over users. Within the next 18 months, Frost & Sullivan predicts slow growth for WAP services but estimates that up to 55% of mobile subscribers will pay for WAP services.

DoCoMo's European Subscriber Forecast

2001: 18.8 million 2006: 31.4 million

SOURCE FROST & SULLIVAN

tralia. Virgin Mobile Vibe offers news and entertainment information via SMS at a rate of 10 messages for an Aussie penny (half a U.S. cent). In addition to news and information, Virgin intends to use the platform for marketing itself and partner advertisers, according to reports.

# KPN to Launch I-Mode-Type Services

Dutch wireless carrier KPN has said it will debut services — based on NTT DoCoMo's i-mode technology — in Belgium and the Netherlands this spring. It will launch first on KPN's GPRS network and will later migrate to 3G networks as they debut.

# Photos by Phone Sell in Japan

The hot wireless service in Japan appears to be J-Phone's digital photo option. In October 2000, the carrier introduced handsets with built-in

#### Western Europe's Mobile Workers

European companies in a variety of industries face increasingly high office rem, building costs, and bad city traffic — all of which will drive the number of mobile workers up in the coming years, predicts international Data Coro. (IDC). The financial, health care, and business services markets have the lastest-growing number of mobile workers throughout western Europe, IDC examples. "DC's study finds most mobile workers will be in modernet and work for either medium or large companies. The mobile workfore — defined as those spending more than 20% of their working hours away from the main workplace — will increase by over 13 million, from 6.2 in light in 2000 to 20.1 million in 2005.

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digital cameras, which can send photos as email attachments. A year later, J-Phone reported soaring subscriptions, and more than half of the new I-Phone subscribers were buying handsets able to use the photo service. I-Phone was scoring nearly 30% of the new subscribers nationwide in October, with virtually all the rest going to NTT DoCoMo. Second-tier carrier KDDI's subscriptions fell in October.

#### capital currents

# Verizon Plans IPA by June

Verizon Wireless, the largest cellular firm in the U.S., announced in November that its long-delayed \$5 billion initial public offering would occur before June. The Verizon Communications/Vodafone Group joint venture said it would go public despite a shaky economy and telecom slump that had, for instance, seen AT&T Wireless stock

#### **Best Return Seen for WCDMA Suppliers**

Deutsche Bank Alex Brown predicts the WCDMA third-generation (3G) network standard will be the most successful 3G technology. with deployments beginning in 2002 (mainly in Europe). It therefore predicts that makers of WCDMA handsets and equipment will have the best revenue growth and thus stock gains in the wireless sector over the next five years. The firm also sees strong potential in CDMA handset makers (the majority standard in the U.S.) that migrate to its 3G version, CDMA2000

#### Projected revenue growth over five v

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lose nearly a third of its value in the year preceding Verizon's announcement. The company had planned to go public in October 2000, but opted to wait when investors began looking askance at telecom stocks. Verizon will be the third of the four largest cellular carriers to go public. The last private firm, year-old Cingular Wireless, has also said it plans an IPO, although no date has been set.

# Sonera Plans to Cut 290 Positions

Finland's Sonera announced in November that it planned to cut up to 290 jobs in an attempt to reduce costs by as much as \$22 million. About 160 positions were to be cut at its Sonera SmarTrust datasecurity division, and another 130 staff members were to be let go from mobile portal Sonera Zed.

# **Huge Losses Shrink Big Companies**

Japan's Hitachi reported a \$921 million loss for the six months prior to September. The company, which blames lower handset sales for the loss, plans to cut 14,700 jobs. Hitachi's loss marks a quick change in fortunes for the company, which had posted a \$5 billion profit during the same period last year.

Meanwhile, German carrier

Deutsche Telekom reported a \$995 million loss for the first nine months of the fiscal year.

The company listed the high costs of next-generation licenses and its acquisition of U.S. carrier VoiceStream Wireless as the main reasons for the loss. Deutsche Telekom had made a profit of \$7.5 billion over the same nine months last year.

# Cvneta Networks Draws \$25M

Wireless hardware and software designer Cyneta Networks reports garnering \$25 million in second-round financing. The round was led by Battery Ventures and included Partech International. Crescendo Ventures, and Vortex Partners. Cyneta said the money would go to commercializing its new resourceaware adaptive switch.

# Visto Finds \$31M in Funding

Visto, a U.S. company that makes enterprise and carrier mobility software, reported in November that it had emerged from a successful \$31 million round of financing. Led by WaldenVC and Rustic Canvon Ventures, the round will fund the company's future growth, including an expansion of Visto's sales force.

Other investors include Bessemer Venture Partners. New Enterprise Associates, GE Asset Management, Allegis Capital, Novus Ventures, and Wheatley Partners. III

#### M-Business 50 Stock Index The M-Business 50 Stock Index Jets you track the linancial health of the mobile and wireless market, based on 50 key global stocks. You can get the latest index values at www.mbusinessdaily.com. 11/28/2001 Index 10/16/2001 M-Business 50 562.92 473.38 Nasdag Composite 1,722.02 1,887.97 NYSE Composite 565.27 575.20 **Dow Jones Industrial Average** 9,384.23 9,711.86



for Enterprise Deployments

Public safety and health care reap the benefits of integrating mobile technology into the way they work

BY HOWARD BALDWIN

-Business has launched its
Mobile Master Awards to showcase companies that have made
the strongest mobile deployments of the year — not just tests
and pilots, but deployments that prove the real-world benefits
of mobile and show a compelling ROI. This year's winners have
distinguished themselves by taking a risk on mobile technology in this early market and proving deployment models that
other businesses stand to benefit from.

Government agencies and health-care-related entities clearly lead private enterprise in 2001 in terms of their willingness to deploy mobile technology and their ability to recognize its advantages. Or it may be that they are more willing to discuss the benefits publicly than other segments concerned about revealing a competitive advantage. Whatever the reason, we've noticed these two segments dominate the deployment examples we've seen throughout the year. While we were surprised that the logistics and transportation industry did not have

more compelling entries, we suspect the reason is that we limited candidates to 2001 deployments. The transportation industry had adopted wireless and mobile technology before then, so its big lessons have largely been learned.

Although we chose our winners solely from full-fledged deployments, we did discover numerous compelling applications still in the planning stages. Many of these should see full rollouts in 2002, bringing a broader representation to next year's enterprise Mobile Masters.

Of the more than 50 entries we looked at, we found that many didn't build their mobile systems from scratch, but rather added capability to existing wired systems to improve employee productivity. "Some of the most successful mobile solutions may not be that revolutionary," says Summit Strategies analyst Jennifer DiMarzio. "Something simple but useful is sometimes the best solution."

The mobile industry should think about adopting "simple but useful" as a mantra. But that doesn't mean staid, Our win-

ners started out as pragmatists and became pioneers:

Daytona Beach, Fla., Police Department, Faced with tourist events that can quadruple the city's population, the city outfitted its police officers with an automated wireless channel into the national wants and warrants database, eliminating a human bottleneck at a time of peak demand.

General Electric Medical Systems. By replacing its field engineers' laptops and cell phones with integrated PDA phones, this GE division eliminated several administrative steps of the repair process and helped increase the efficiency of the workers servicing multimillion-dollar computer tomography scanners.

Moses H. Cone Health System. The hospital's system that lets staff doctors synchronize patient information onto their handhelds isn't earthshaking. but letting community doctors in private practice also use the system is. The hospital is also incorporating results of lab tests so that the pharmacy can quickly flag potential drug interactions or dosages that need to be adjusted.

San Mateo County, Calif., Public Safety Commission. Having consolidated its cities' systems for dispatching fire brigades to emergencies, the county's battalion chiefs needed to coordinate fire-fighting efforts among multiple units at the incident. So the county's new system broadcasts the equivalent of an organizational chart, letting everyone at a fire know their responsibilities and everyone else's.

What characteristics do these deployments share, besides their simplicity? Both Moses Cone and the County of San Mateo were willing to be unorthodox to achieve their strategies: They agreed to be guinea pigs for their developers, paying for the solution with their expertise and experiential feedback rather than cash. This is a win-win deal - in return for a commitment solely of time, an entity gets a mobile system. The vendor gets to see how its software behaves in the real world. For providers, this concept can't work forever, but in the immediate future, daring companies partnering with hungry startups can move the industry forward. In fact, once it was convinced of the software's value. Moses Cone did write a check.

> Howard Baldwin is M-Business' deputy executive editor.

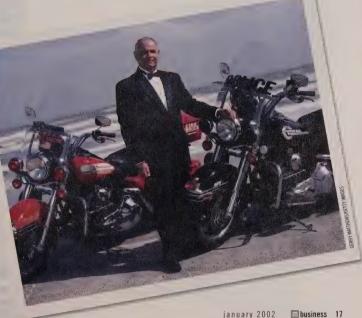
# Daytona Beach Police Department

#### Speeding up access to crime databases makes officers more efficient

he resident population of Daytona Beach, Fla., is a manageable 65,000 people. But tourism is far and away the city's most lucrative industry, so come spring break, Bike Week, or the Pepsi 400 at its International Speedway, the population can quadruple. At those times the city's 130-member police force finds it much harder to get accurate information about suspects when those suspects are detained, so the police department built a system that lets public safety officers do background checks faster. "The [new mobile] system takes the burden off our patrols and our communications during the influx," says police sergeant Al Tolley, the department's spokesman.

Here's how communication works in the city: The police department uses three radiofrequencies - one for dispatchers to communicate with officers on the west side of the city, one for dispatchers to communicate with officers on the east side, and one for a teletype operator to communicate with officers citywide. The teletype operator's job is to access local, state, and federal databases listing outstanding warrants for crime suspects and automobiles. Traditionally,

Networks analyst Gene McWilliams savs wasted police time is way down in Daytona Beach.



# MUBILE WASTER (200108

when an officer stopped a car or a suspect, he would radio the teletype operator and ask her to access the information. The operator would query the appropriate databases, and report the results to the officer. However, this process caused two problems.

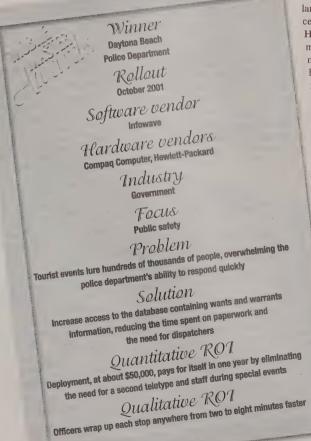
First, while an officer was communicating with the teletype operator on her radiofrequency, he couldn't monitor the communications between the dispatchers and the other officers patrolling that particular side of Daytona Beach. "If the officer's on a different frequency running a tag [license plate number]," says Tolley, "he can't respond to a call that goes out."

Second, a backlog is created when tourists descend on the city. Besides the traditional tourist season from January through April, the city sponsors special events that, taken in full, cover 10 weeks a year. When officers all over the city are communicating with the teletype operator, the effect is the same as at an airport with only one air traffic controller — requests stack up. In peak periods, the two-year-old federal National Crime Information Center database, which tracks information across 17 crime categories, can take as long as two minutes to return data, says Gene McWilliams, a senior network systems analyst in the department's IT group. The situation is exacerbated because searching for outstanding warrants on tourists — as opposed to citizens of Daytona — means checking more than just local and state databases.

The department's solution was to take the teletype operator at least partially out of the loop. McWilliams deployed software from wireless tool vendor Infowave to convert information from the database so that it could be accessed directly over the department's Cellular Digital Packet Data (CDPD) network via the officers' Pocket PC-based handhelds from Compag and Hewlett-Packard. This addressed both problems simultaneously. "Because the officers can access information while still listening to the radio, you have a higher level of safety," says Tolley. "If an officer's using a handheld and he hears the call on the radio, he can cut loose what he's doing and respond. It gives them more opportunity to prioritize their own work" as opposed to waiting for results from the teletype operator. (The teletype operator will never be removed from the loop completely, notes Tolley, because the officers use her to double-check and print out active warrants. This is done so that a hard copy of the warrant can be present at the police station when the suspect is brought in, as federal court guidelines dictate.)

The system's qualitative ROI is obvious, says Tolley: It makes the public safety officers more efficient, which could ultimately help keep Daytona from having to hire more officers. "We can only have a suspect and a patrolman stand there doing nothing for a short period," adds McWilliams. The patrolman may have to deal with other calls, while an innocent tourist may become understandably indignant about being detained. With the Infowave system in place, officers can wrap up traffic stops faster.

Determining a quantitative ROI is harder. If the department deployed an additional teletype operator for special events, the cost would be around \$48,000 (\$5,000 for installing the teletype machine and the rest for staffing it during special events). But the new handheld system should eliminate that



need. So with an approximate cost of \$50,000 for hardware and software, the project pays for itself in one year.

An added benefit is a more traditional one: Officers can use the Pocket PC-based handhelds to file their reports, so they spend less time at the station house and more time in the field. In addition, the state has mandated that police departments track the race of everyone they stop as a way to monitor whether officers stop people of some races more than others (a practice called racial profiling). "We have this data-gathering built into the PDAs, so the reports are filled out in the car. They're instantly stored, transmitted, and tabulated; and the police chief can access the results almost immedi-

ately," says McWilliams.

Moses Cone CIO John Jenkins and pharmacy coordinator Jean Douglas have made it faster for doctors and staff to get patient information.

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# Moses H. Cone Health System

Disseminating patient information among staff and doctors in private practice boosts efficiency

t first glance, the mobile technology installed at two of the five hospitals in the Moses H. Cone Health System in Greensboro, N.C., seems remarkably prosaic. Physicians synchronize their Palm OS-based handhelds with the central patient database, getting the most up-to-date information. There's no need to check handwritten charts, scribble notes from computer terminals, or print out lab results. The system eliminates not only reams of paper but also the hieroglyphics that physicians scribble on them. Thus, physicians can interact with their patients with accurate information at hand rather than on a computer screen down the hall (and without the hospital's having to put a terminal in every room). But Moses Cone CIO John Jenkins has expanded the numbers of those who can take advantage of the synchronized data and thus more efficiently highlighted the data that needs immediate response.

Like many other hospitals, Moses Cone uses synchronization because it's convenient and less expensive than deploying a wireless infrastructure (which Jenkins estimates would cost about \$500,000). So what did Moses Cone do differently? It took several incremental steps forward in both the technology it used and the kinds of users it involved. Its system includes its phar-

macy, and it let community doctors participate in the program using their own Palm devices. The result: Doctors save at least a half hour each day, and the pharmacy staff members save an hour.

Here's how the system works: On each of the five floors of the hospitals is a \$2,500 synchronization tower from Clarinet Systems. "It's not like the cradle that sits on your desk," says Jenkins. "It looks like a PC tower." Physicians slide in their Palm OS handhelds and press a button; the tower updates information on their patients via the PDA's infrared port. The client software that runs on the Palm device was developed by MercuryMD, which also worked with Extended Systems to create the software that downloads the patient information from the hospital's legacy systems. An initial synchronization can take about 15 minutes, reports Jenkins, with updates during the day taking anywhere from two to five minutes. The initial length of time is a drawback, Jenkins acknowledges, but Clarinet is working on making the transfer time faster.

The pharmacy gets involved because it needs to compare lab reports with the desired results. A patient hos-

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# MUBILE MASTER Awards

pitalized for a blood clot, for instance, will be prescribed a drug such as heparin that thins the blood; however, determining the proper dosage is a trial-and-error process. Thus, a lab result determining that the patient's blood hasn't been thinned sufficiently will require an immediate adjustment of the dosage. The quicker the patient gets the proper dosage, the sooner he can be sent home.

But when lab results are delivered on paper, it's not always immediately obvious that someone still has an out-of-range result. The issue is one of timing: The paper report could be several hours old, in which time the blood may have thinned out sufficiently. Or maybe it has thinned out some, but not enough. Either way, the dosage administered based on the paper report's findings may no longer be

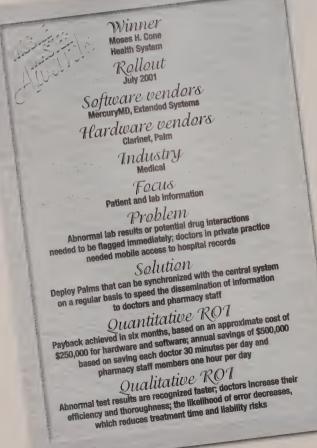
what's best for the patient. To deal with this, Jenkins deployed Palm IIIc handhelds to the pharmacy. The pharmacists use the same synchronization system as the doctors. "The abnormal values are in red and the rest are in black," says Jean Douglas, clinical coordinator of pharmacy services for the Moses Cone System. The synched data is much more current than the paper reports, and it can be updated on demand. That way, the pharmacy can immediately identify who needs to have their dosages adjusted.

The new system aids the pharmacy staff in several

The new system aids the pharmacy staff in several ways. To access and write down the lab results for 50 patients from a desktop computer would take an hour. Douglas says; printing out the reports would be no more efficient. Besides saving the hour, the pharmacists report higher job satisfaction, she notes: "If you're not writing everything down, you don't feel like you're doing clerical work." The handhelds in the pharmacy also include a drug-interaction program so that if a pharmacist finds a patient is on two incompatible drugs, she can get one of them changed. The physician can override the decision, but the pharmacist has the tools to make the suggestion. "This lets us be proactive," Douglas says. While drug-interaction software is common in pharmacies' desktop systems, having it on the handhelds lets pharmacists make decisions when they're with the patients in the wards; they don't have to wait until they're back at the pharmacy.

Having that kind of information handy inspired seven employees to go out and buy their own Palms, because only five Palms were budgeted for the pharmacy (those are still being shared from shift to shift). Besides the drug-interaction and test results, the handhelds can download everything from calculators for titration rates to employee schedules.

A key feature in the Moses Cone deployment is that it lets doctors in private practice within the Greensboro area use the system, as opposed to limiting participation to staff doctors. Matt Martin, a trauma surgeon at Central Carolina Surgery who performs some surgeries at Moses Cone, says that the MercuryMD application increases both his efficiency and his thoroughness, in part because it's so simple: "Technology helps people when it's easy to use, intuitive, and you can pick it up without a learning curve," he says. When Martin goes to the hospital and synchronizes his Palm, it automatically uploads all the people he needs to see that day, whether they're his patients or his partner's patients. "There's a wealth of information that's now at my fingertips. I can get it more easily than having to sit down a computer terminal, log in, and go through multiple screens."



Calculating the ROI on the system is difficult, Jenkins says, because the hospital's key metric for saving money is the patient's length of stay, and it's difficult to measure how getting information faster affects length of stay. "If you can reduce the length of stay, it could increase patient satisfaction and physician satisfaction. But there are any number of interacting variables that contribute to length of stay. If we reduce it, is it because of the Palm devices? I don't know how we're going to tie it in to operational efficiency, except anecdotally." Nonetheless, he does see a value in saving time for the doctors and the pharmacists. "Does that mean we can reduce staff? No. but it means they can deal with more patients."

Jenkins knows he's on to something important because of the positive reaction from the doctors. "Doctors tend to be pretty skeptical about these things, but there's been universal acceptance and enthusiastic support — which is something I'm not used to in health care."

# San Mateo County Public Safety Commission

During the chaos of a fire, a battalion chief uses mobile technology to keep track of his crews

very fire engine in San Mateo County, Calif., has the same equipment on it, in pretty much the same location. The same axe. The same flashlight. "It's very standardized so you can find anything in a hurry," says battalion chief Richard Price. "That's typical of fire trucks." The fire trucks in San Mateo County have one more piece of standard — though not typical — equipment: Palm handhelds.

In 1999, all but one city in the county brought their 56 fire stations into one dispatching system. The goal was to ensure that the closest fire crew was dispatched to an incident, not just the crew within the right city limits.

At the same time in 1999, the company that built the county's dispatch system, Telecommunications Engineering Associates, created a dot-com division called FireDispatch.com to build Web-based systems for public safety departments to let fire crews and citizens keep track of incidents within the community. When the dot-

Richard Price can now deploy firefighers more efficiently in a crisis.

looked as though FireDispatch.com would go with it, until TEA CEO Daryl Jones came upon the idea of adding a wireless gateway to the Web site to get real-time incident information out in the field, where it was most valuable. That way, the consolidated realtime information on the Web site could be transmitted to any-

com craze burned out, it

one with an authorized mobile wireless device: that is, the crews on and approaching the scene.

When a call is made to one of two county dispatch centers, the relevant information is entered into a central database. According to Jones, the data is then reformatted, depending on the call and who's authorized to see the information. If it's a medical call, public safety personnel get all the pertinent information, but the public can see only the street address, as required by law to protect patient confidentiality. If it's a fire, the system also gives information about any hazardous materials within the property. Next on Price's wish list is the ability to have a Web-based camera in a car to

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# MUBILE MASTER/LUCITAS

broadcast live video from the scene.

Price uses the FireDispatch information not only to keep track of where everyone is but also to build an ad hoc hierarchy of each unit's assignment — kind of an on-site org chart. "We can keep track of people's job assignments. I might have one on the roof of a building. I might have another unit checking exposure next door, an operations center down the street, and other units waiting at a staging point," he says. If more firefighters are required, he can see what resources are still available throughout the county.

The top priority at any incident is accounting for each firefighter's position. A few months ago, a building collapsed during a fire, and Price was able to determine from his org chart who was safe and who needed to be found immediately.

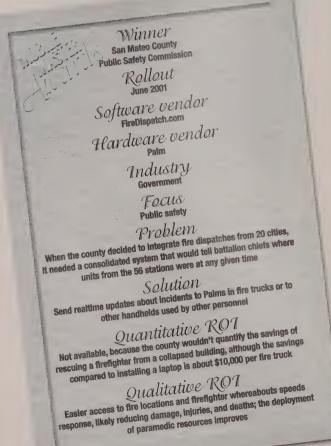
As he keys in each unit's assignments, the information is transmitted to the FireDispatch server and rebroadcast to every fire engine and every chief, whether they're on-site or not. Although the engines all have Palm V (equipped with Novatel modems) or Palm VII devices, other fire personnel, such as chiefs or investigators, can carry any device they want, from a Compag iPaq to a Wireless Application Protocol (WAP) phone. "We allow anybody who's not associated with a vehicle to choose their device," says Price, "You have to have a pretty big ego to say, 'This is the only device you can use." His reasoning: Not every device does everything well, so someone in the department who relies heavily on email may want to use a Research in Motion Black-Berry; someone who needs Microsoft Word and Excel may want a Compaq iPaq.

The San Mateo County fire trucks were originally equipped with laptops, which were problematic, according to Price. It cost \$10,000 and eight weeks just to mount the laptops on each truck, because each truck required custom mounting. The maintenance updates that went along with keeping a Windows system up and running were aggravating as well, says Price, adding, "With handhelds, we can equip an entire battalion in a day."

Another reason Price prefers handhelds to laptops is their speed and simplicity. "Our applications are very focused and very refined. They do one or two things very well and very simply. None of the applications are complex." They have to be simple, Price insists: If you want to build these applications into the fabric of your organization, the most technophobic fire chief has to feel comfortable with them — "otherwise it becomes a novelty, not how you do business."

San Mateo County exchanged its firefighters' time and advice on what the software should have in return for the deployment; in doing so, it saved about \$10,000, the cost of the application that FireDispatch.com now sells. (Other clients also incur a service charge ranging from \$500 to \$1,000 per month.) "We traded [TEA's] services in exchange for our expertise in fighting fires," says Price. "TEA got guys like me perfecting the applications for it."

And even though his expertise is in fire, Price offers sound advice to the mobile industry: "The problem with mobile applications," he says, "is that everybody's looking for this big successful horizontal application that will change wireless. I see a lot of them get developed, and then whoever builds them tries to find the user. The verticals get overlooked because you have to have a lot of knowledge about the business. But only by having our targeted, focused applications has wireless become invaluable to us."



# General Electric Medical Systems

Smart phones do the trick to improve service where laptops and cell phones prove unwieldy

eneral Electric Medical Systems computer tomography (CT) scanner costs anywhere from \$300,000 to \$1 million. Hospitals generally charge as much as \$400 for a CT scan, done in the course of determining neurological, cardiac, or other disorders. As it would with any expensive, sophisticated appliance, GE offers service and extended warranties. That makes fast service and information updates to customers critical. But GE Medical's 2,400 U.S. service engineers were spending a third of their time on administrative activities so daunting that they would procrastinate for days on filing their paperwork. A hospital administrator could check on the progress of a service call via a GE Medical Web page and conclude that a CT scanner hadn't been fixed, when in reality the Continued on page 26





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# 17 New Ways to Charge for Data?

Get the M-Business "Profiting from Option-Rich Networks"

report for an in-depth guide to a host of rich new

# charging opportunities

he paradigm for charging for mobile data services is about to change. Today, you have no real choices: Carriers are stuck with perminute pricing, and providers have no real way to gain revenue share. The result: stagnation.

But a new breed of intelligent network elements is emerging to let you charge flexibly for service and content, supporting some 17 charging options and innumerable new business models.

These "option-rich" networks will let 2.5G and 3G deliver on their m-business promise. And those companies who act first to take advantage of this paradigm shift stand to gain the lion's share of mobile data revenues.

#### What's in it for you

If you plan to capitalize on this opportunity, you have a narrow timeframe in which to act. You need to identify the most lucrative charging models for your business, cut deals with partners, and drive support for the No other report provides such a thorough analysis of how to profit from this important new ecosystem. Here's what "Profiting from Option-Rich Networks" gives you:

Detailed analysis of which of Insight into how to position 17 new payment paradigms are your company in the value chain likely to take off to remain integral to mobile commerce and secure the highest possible revenues An overview of the new value chain the option-rich charging market will create on-Rich Networks Details of the kinds of partner ships and deals likely to prove Insider perspective from key most profitable players shaping this emerging An original survey revealing how other business strategists plan to exploit this opportunity

Details on how carriers are

making charging deals, what

choices they tace, and what

opportunities are opening as a

An index and cross-analysis of a new community of vendors that's now surfacing to enable new payment models

payment options most critical to your business model.

- Carriers charging by packet will not be enough. You will need to offer a variety of charging models so you and your partners will be able to generate new revenue. Adding rich charging options to your network represents your best opportunity to reap the full benefit of your spectrum licenses and network upgrades.
- Mobile content and service providers to succeed, you need more control over your charging options. Now is the time to master the new payment paradigms that option-rich networks enable so you can exploit them as soon as they're available. You face a limited window of opportunity to position your company at the front of the pack and cut deals based on these new models.
- Enterprise decision makers these new options will change how you are billed for services. You can't afford to sit back and see what develops. Now is the time to negotiate with and lobby providers to make sure your business needs are supported.

#### The insight you need

The new "Profiting from Option-Rich Networks" report from M-Business Research drills into this vital new area of opportunity. With in-depth insight into market timing, revenue potential, viable business approaches, key driving technologies, and potential entry points and returns, this report paints a picture of the full landscape and evaluates the charging models, supporting technologies, and driving enablers shaping it.

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#### METHODOLOGY:

M-Business Research provides in-depth reports with actionable insight on how you can turn new mobile market opportunities into critical business advantage before your competitors do. This M-Business Research Report bases its analysis and projections on 105 qualified one-on-oninterviews with wireless carriers, content and service providers, enterprise strategists, technologists, and vendor organizations. M-Business Research reports are also molded by original survey data conducted by M-Business, comprehensive reviews of existing projections pertinent to the market being investigated, and extensive input from the M-Business editorial board.

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Read the complete Executive Summary section online!



# MUBILE MASTER (wards

Continued from page 23

field engineer simply hadn't updated the records. Naturally, the administrator would wonder why the hospital was paying for an extended warranty.

The company had to look for better options, says Mike Friguletto, general manager of the GE Medical global service delivery division: "We wanted to reduce administrative work time to 5% so engineers could spend more time with their customers, and we wanted to increase the timeliness of data from one week to four hours."

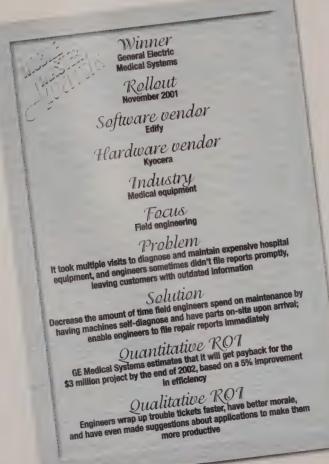
Previously the field service engineers had carried laptops and cell phones but, says Friguletto, "with all the tools they had to carry, the laptop was the last thing they worried about." As a result, the field service engineers would follow the path of least resistance: If they'd ordered a part and it wasn't there. they'd use their phones to call a clerk who'd read the information off a computer screen. Because they didn't have their laptops with them all the time, the engineers found it easy to put administrative chores off until the end of the day — or the end of the week.

GE's response was to fundamentally rearrange their workflow, says Friguletto. The engineers turned in their laptops and their cell phones and received Kyocera Palm OS-based "smart phones" in return. The CT scanners, connected through a virtual private network, relay self-diagnostic reports to an operations center. The field engineers, in turn, can access this information remotely, giving them a head start on ordering parts and checking their shipping status; GE has also set up a link to the FedEx Web site, so that the engineers can see who signed for a part. "There have been times when a customer says they haven't received a part," says Friguletto. "The engineer can now show who signed for it, and say, 'Let's go find him'."

In all, the project cost \$3 million, including the development of the Web-based applications and the purchase of the Kyocera hardware for all the engineers. But Friguletto calculates GE Medical's savings at \$15 million annually, derived from the engineers' administrative savings and by their use of the one smart phone device rather than a regular cell phone and a laptop. Based on these calculations, the project will pay for itself in a matter of months.

At the end of November, GE Medical Devices had deployed 800 devices, with 1,500 more field engineers to be supplied by June. That leaves 100 who won't get the Kyocera phones. "Not every engineer will get one because of holes in wireless coverage, such as in Nebraska and the Dakotas," Friguletto says. Even in the areas in which carriers claim to offer coverage, GE is testing to make sure the coverage is actually there. "We don't necessarily trust what the carriers say about their coverage," he says. However, there's enough coverage for enough field engineers to make the program worthwhile, he adds.

What surprised Friguletto most about the deployment was the reaction of the field engineers, especially given their lack of enthusiasm for the laptops. "They love that they can do what they need to do without calling anybody. They can show the results of their search to the customers. It's a morale booster to show that we're investing in our engineers [in a way] that makes them more productive." In fact, the engineers are now proposing new applications. "We thought this would be a radical culture shift," Friguletto says, "but it's been one of the smoothest programs we've done in a while."



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Foretelling a young market's future is notoriously hard, but that makes it all the more important

# **Predicting the M-Market:**

# A Year in Review

hat would you have done differently this past year if you'd known that, say, Palm might become the weakest link in the PDA space? Or that carriers still wouldn't have committed to E911 technologies? Or that the iPaq would have gotten such a following? Or that Bluetooth would still be just over the horizon? In this stillnascent wireless market — especially in the current economic downturn — finding a way to gauge market opportunities isn't an amusement; it's an essential survival tactic.

And, as frequent readers of *M-Business* know, it's a practice we take quite seriously. Over the past year, we've purposefully stuck our necks out to predict new markets, technologies, and policies as well as threats to the market. Now, as the new year begins, it's time to take a look back at how wireless has changed.

where it's likely to go in the coming year, and, of course, how well we did at predicting its movements.

#### LONG LIVE WI-FI

We initially turned up our noses at 802.11 wireless networking (known as Wi-Fi) because we weren't interested in technology that simply eliminated cables. But hey, when you take wireless networking out of the office and put it in an airport, a train station, or a coffeehouse, you start rewriting the rules of mobility. And that's exactly what we started to see in early spring.

As we reported in July, airports were delaying the deployment of wireless LANs so they could figure out how to make money from them rather than ceding the profits to 802.11 providers. But that didn't stop American Airlines from deploying wireless LANs in 31 of its 34



value is obvious for both parties: Guests can access the Web, and hosts can use Wi-Fi both as a marketing tool and for their own networking needs (roving wireless check-in, anyone?).

In August, we reported that interest in 802.11 had grown so much, the caffeinated 11Mbps speed of 802.11b was offered in coffeehouses across America — not only in chains like Starbucks but in smaller diners and restaurants as well. Although some analysts had suggested that 802.11 would die once third-generation (3G) data services became a reality, it's crystal clear that Wi-Fi's "grassroots movement," as we termed it, has sprouted lushly — MobileStar's demise notwithstanding. Even the wireless carriers are now looking to deploy 802.11 in the enterprise.

#### A SECOND OPINION FOR BLUETOOTH

By contrast, our prognosis for Bluetooth, the technology designed to let devices communicate wirelessly within a range of 30 feet, has yo-yoed. Early on, we bought into its promise, saying that Bluetooth-enabled consumer products would be available by last December, probably because Hewlett-Packard said it would give its Omnibook 500 subnotebook Bluetooth capability (it was reported that

Compaq was doing the same for its M300 subnotebook). Even in April, we were quoting analysts who were saying, "People need Bluetooth. Clutter is the enemy of every mobile worker."

Yet, as the year went on, it became clearer that the 802.11 standards for wireless networking had elbowed Bluetooth aside. Our big sin was not thinking carefully enough about the realities of chip manufacturing and the time it would take to get Bluetooth chips at the prices and volumes necessary to make them a nobrainer in consumer-level devices. However, we still assert that Bluetooth will have its place. When Microsoft announced that it wouldn't include Bluetooth support for Windows XP, we said, "Call us when they say they're *not* going to support it in Pocket PC" — well, Microsoft has now decided to support Bluetooth in Pocket PC 2002.

Bluetooth is bouncing back, and not just in its original mission of a technology for peripheral connectivity, where you could take your Bluetooth-enabled PDA to

a Bluetooth-enabled printer and print a document.

Early deployments, such as the one we profiled in October at the University Hospital in Mainz, Germany, are revealing a unique advantage for Bluetooth. Its low power requirements – Bluetooth chips require



# M-Business Point by Point then

From our first issue, we've raised issues and shared our thinking in hopes of helping readers clarify their own strategies. In our Brain Trust and Front Lines columns, we've tackled 24 ideas. Here's where they stand today. - Galen Gruman

Content

#### NOVEMBER/DECEMBER 2000

A safe, simple environment like America Online's is key to mass mobile adoption. FRONT LINES: Mo recommends a cautious mobile strategy, while Galen advocates a stronger commitment to pilots and tests.

#### JANUARY 2001

BRAM TRUST: Application service providers will be an early casualty in the mobile economy. FRONT LINES: Galen is skeptical of converged devices, while Mo is more optimistic.

#### **FEBRUARY 2001**

BRAIN TRUST: We identify infrastructure and the services that facilitate today's culture as the safe places to invest a business's strategy in.

FRONT LINES: Galen urges businesses to avoid consumer-oriented offerings unless those are their core business, while Mo suggests small steps such as selling ringtones, not full-blown multimedia.

We argue that fear will drive mobile adoption: fear of missing out and fear for loved ones' safety. FRONT LINES: Mo argues that PDAs are the better platform for m-commerce, while Galen thinks the ubiquity of phones makes them the better bet - if someone makes the interface work right.

BEAIN TRUST: The car is a perfect place to make mobile data services happen.
FRONT LINES: In rare agreement, Mo and Galen say not to wait for 3G. Galen doubts it will ever happen,

while Mo thinks we'll at least get something close enough.

IN TRUST: The economy is sputtering, and we counsel a steady, incremental approach to mobile data to preserve investments while not opting out of the future

FRONT LINES: Galen thinks streaming video and multimedia is the dumbest idea he's heard in a long time. Mo sees a future in 2003 for targeted uses.

BRAIN TRUST: We argue that government should take a leadership role in mobile wireless data, to help unify the industry so businesses will have an infrastructure they can count on. FRONT LINES: Galen thinks ads will help pay for wireless content under certain circumstances, while Mo

believes that a service-oriented wireless content model will prevail, with fees per use and subscriptions.

BRAIN TRUST: We argue that the economic downturn gives companies an advantage in dealing with mobile

providers, one they should exploit.
FRONT LINES: In another rare agreement, Mo and Galen argue that push-oriented location-based advertising is doomed to fail for consumer and technical reasons.

BRAIN TRUST: The staff says a few companies acting as rebel leaders can pioneer effective mobile data services and break the "No, you go first" logiam that the slow-moving carriers and providers have created. FRONT LINES: Galen thinks the mobile virtual network operator is being overhyped in the U.S. and will serve just limited markets. Mo vehemently disagrees.

#### SEPTEMBER 2001

BRAIN TRUST: We advocate a cautious approach to services that could impinge on user privacy, to avoid a backlash that could derail mobile services

FRONT LINES: Mo thinks PDA makers have blown their chances in the wireless arena through timid offerings. Galen agrees about the timidity but hopes Handspring might finally have set the right example.

BRAIN TRUST: We dismiss analyst predictions that wireless consulting and integration boutiques will die as

big firms take over.

FRONT LINES: Mo and Galen agree for the third time this year, this time that the wireless Web is not going to

BRAIN TRUST: The staff predicted that a new kind of premium-service operator would arise as next-generation rollouts occur, charging people more for higher-priority and other forms of guaranteed service FRONT LINES: We saw a trend of companies providing front-end infrastructure to carriers to allow such things as premium or audience-specific data services. Galen thought this was evidence the carriers were now seriously looking at mobile applications and services, while Mo doubted the carriers' intention to get serious about being "smart pipes."

AIN TRUST: We saw very difficult times for the location-based services market, given the E911 delays. A few niches will hang on — those that don't require the specificity of E911 — and will be the seeds for a later location boom in 2004.

FRONT LINES: Late fall saw a few consumer-oriented wireless devices announced, making us wonder whether this foreshadowed a renewed interest in a consumer wireless market. Mo thought indeed such a market seemed to be forming, though she didn't think the fall's batch of products — the Danger Hiptop, Gitwit phone skin, and Handspring Treo — would kick off mass adoption by themselves. Galen thought it was way too early for a consumer market in the U.S., as the next-generation networks first needed to be rolled out broadly and consumers needed to see examples of compelling services.

AIN TRUST: We still believe that, and AOL's moves this summer into mobile confirm our belief. FRONT LINES: Companies have clearly been hesitant, and 2002 will bring more of the same caution, except for early-adopter industries like transportation, logistics, health care, government and public safety, and financial services.

BRAIN TRUST: This is indeed true, with consolidation common and many ASPs seeking to reinvent themselves

FRONT LINES: The first models have been clunky, but the industry still promises to get these right. The jury's still out.

BRAIN TRUST: We still believe that these are the best opportunities. As proof, we see success in companies like InPhonic and Opass. FRONT LINES: We were both right.

BRAIN TRUST: The first kind of fear is fundamental to the BlackBerry's success, while the second helps drive adoption of consumer voice services — but not, so far, data. FRONT LINES: M-commerce is slowly happening in the U.S., with ringtones on phones. But wireless PDAs are only now appearing, so we'll have to wait to see.

BRAIN TRUST: It still is, but the telematics industry is way behind on making it a reality.
FRONT LINES: 3G is years away at best, but 2.5G and 3G Lite (see the special report in the November issue) are finally rolling out. You still need to wait for 3G, but not so long for nextgeneration services.

BRAIN TRUST: Even more so, this is a vital strategy FRONT LINES: We're still split, and 2003 is a year away.

BRAIN TRUST: The government has other priorities, though the FCC has helped simplify our fractured standards by finally endorsing software-defined radio, which can let them coexist more easily. FRONT LINES: No one has succeeded yet with either approach.

BRAIN TRUST: This is even more true, as it becomes clearer that relatively low-cost investments can get real payoffs

FRONT LINES: It's clear to most people today that opt-in is the only way to go.

BRAIN TRUST: Nextel has proved us right, and the major carriers are taking at least initial steps. We expect the trials by the Sprints, Verizons, Cingulars, and Nextels to spur their competitors even more

FRONT LINES: We're seeing multiple MVNO strategies emerge, from the niche to the mass market. It looks like Mo was right.

BRAIN TRUST: All wireless marketers say they will respect user privacy. If they do what they

say, we'll be fine.
FRONT LINES: Palm announced a new wireless device in September but later retreated. Handspring is set to release its products soon. But more is needed. We'll soon see whether the new Pocket PC is able to provide the needed platform.

BRAIN TRUST: Big firms like IBM Global Services remain cautious, while the survivors of 2001's boutique consolidation continue to encourage wireless adoption, not just respond to requests for it. The next year will be tough, but enough will survive.

FRONT LINES: We're pleased to see the applications focus of Nextel finding its way to more carriers, such as Sprint, as well as the payments approach of Cingular and providers like FreedomPay.

BRAIN TRUST: We still like the idea but believe it will take at least nine months for the networks to be tested and stable enough for carriers to be comfortable making such service commitments. FRONT LINES: We remain split, though there's a tad more evidence with the rollout of General Packet Radio Service (GPRS) that the carriers could actually move forward here.

BRAIN TRUST: Location services providers remain stuck seeking opportunities abroad — if their services are transferable to other geographies and cultures — or trying to hang on in the U.S. for a couple more years on venture funds or non-location-dependent variations of their services. FRONT LINES: We remain conservative in our estimations for a 2002 mass market, though Mo remains more optimistic than Galen

# A Year in Review

1 milliwatt of power versus the 802.11b chips' need for 100 milliwatts - make it suitable for PDA users roaming in a limited area; as a result, users don't have to recharge batteries as often.

And we've staved away from the false Bluetooth-versus-802.11 argument so common in the mass media. They're different technologies to solve different problems. There's a little overlap, as in Mainz, but those situations are the exception.

#### WAP GETS WHACKED

Our staff has been skeptical from the start about the Wireless Application Protocol (WAP), for which analysts in fall 2000 were predicting a market size of \$4 billion in 2002. In our premier issue, consultant Jakob Nielsen warned that WAP was doomed because "phones aren't PCs," and analyst Alan Reiter decried how the carriers were misusing WAP as an Internet-access

In technology it's hard to know what's real and what's surreal.

#### It's even harder in the mobile and wireless

method. Our own analysis in that same issue pointed out WAP's problems but asserted that, as a technology, WAP could make a positive contribution. Alas, while the industry remained stuck on the vision of the World Wide Web on a cell phone, we were looking at a 160-by-160-pixel, black-and-white screen at the end of a 9.6Kbps connection - at best - and suggesting more realistic services for such a connection.

We recognized that when people debated the pros and cons of WAP, they frequently weren't talking about a set of connection protocols (WTLS) or a markup language (then WML); they were talking about a way of interfacing with a cell phone.

In April, we reported that WAP might not be dead, that there was still a chance to use it wisely. We didn't buy into the revisionist thinking that struck the U.K., in which WAP was blamed as the root of all mobile ills. Analysts suggested that we'd start seeing uptake right about the time you're reading this, but we're still waiting. Can WAP, in the same way Bluetooth has, engineer its resurrection? Perhaps. WAP 2.0 supports XHTML, a markup language based on the Internet standard that's reputedly easier to use than the Wireless Markup Language (WML). The important thing to keep in mind is that calling WAP a success or a failure depends on how you define it. If you're using "WAP" as shorthand for "the Wireless World Wide Web," it's dead. If you understand that WAP is a useful collection of data protocols – an infrastructure - give yourself a gold star.

#### THIRD-GENERATION REGENERATION

When M-Business debuted, we noted that the U.S. lagged behind the rest of the world in 3G deployments. In a short time



# A Year in Review

span, this stopped looking like a bad thing, given the exorbitant cost of licenses in Germany and the U.K. and the technical problems encountered during pilot tests in Japan. Suddenly we had the opportunity to learn from the blunders of others, and analysts predicted that the U.S. might eventually leapfrog the rest of the world.

In our premier issue, AT&T Wireless ambitiously predicted it would roll out 3G by the end of 2001. Except it's not really 3G; it's really General Packet Radio Service (GPRS). And it's not really rolled out; it's just in a half dozen cities. Clearly, there's a need for an independent party to set some clarity for what the promises really mean (coincidentally, we did so in our special report in the November 2001 issue).

#### WHERE ARE LOCATION SERVICES?

Last January, we investigated the promise of location-based marketing - the ability to pinpoint the location of cell-phone users in order to market to them. This capability was supposed to give direct marketers a new type of data with which to segment customers for special promotions. One vendor said, "I can drive people to brick-and-mortar in a way that the Web just can't do. Location is the heart of mobile technology." But we saw many possible pitfalls to location-based services, not the least of which was the carriers' decision to ignore the FCC's Oct. 1 deadline to roll out E911 - required for every location service. Now every major carrier and many of the second-tier carriers have gotten an extension from the FCC, with the FCC acknowledging that its original timetable was too optimistic.

We also called into question the logic of location-based advertising. Cell-phone users resent the idea of ads being pushed on

them. At the same time, we've seen the real revenue possibilities of getting people to volunteer their locations. For example, in our October 2001 issue, we looked at ZagMe, which delivers coupons via Short Message

Service (SMS) to shoppers who request them within the confines of a London mall. ZagMe and others have since died, but the idea lives on. We'll continue to keep an eye out for such interim solutions to

location-based marketing, which are frequently the most intriguing.

#### WHAT'S NEXT?

In technology it's hard to know what's real and what's surreal. It's even harder in the mobile and wireless data industry because no single company can move the industry forward by dint of its own efforts the way that such heavyweights as Microsoft or General Motors can. This industry requires an unprecedented level of cooperation between carriers, government, hardware manufacturers, and software developers. Any one of these entities might have a brilliant strategy to advance the technology, but another's hesitation or stubbornness or even stupidity might keep the strategy from bearing fruit.

Even though wireless networks are slower – and moving more slowly into the enterprise – than initially expected, the 802.11 movement, coupled with the real ROI in many synch-based systems, shows that there's real opportunity in mobile. The trick is picking out the underlying trends from all the noise. We'll see next year how well we helped you do that.  $\square$ 

- Howard Baldwin and Cameron Crotty





More valuable than the device itself is the security and confidentiality of your corporate data. Hundreds of thousands of handheld devices are stolen or lost this year alone. When this happens, unauthorized persons may get access to the stored confidential information. Secure deployment of handheld devices in business use requires a high-performance file encryption application on every device.

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adoption

# **First GPRS**: No Brave New World

AT&T, Cingular, and VoiceStream roll out their 2.5-generation networks, but who benefits?

he sleek silver phone beeped at its owner as she sat in a hip downtown Seattle hotel. The Cleveland Indians had scored a run against the Seattle Mariners, and the Cingular Wireless project manager briefing me on how to use the company's new General Packet Radio Service (GPRS) phone wasn't happy about it. But she was happy to point out that her phone had just received data transmitted over one of the nation's first secondand-a-half generation (2.5G) networks even though the text alert appeared no different from the playoff updates that thousands of baseball fans everywhere received over plain old second-generation (2G) data phones.

GPRS is a technological step up from current wireless networks because it provides an always-on connection to data over more efficient foray

For more on what 2.5G brings, see "2.5G's First Foray," September 2001 M-Business --- www. mbusinessdaily.com/sep/

packet-switched networks rather than traditional circuit-switched networks. The carriers claim two speed-related benefits from the technology: quicker transmissions of data and quicker connections to data. But it's the real-world performance that users must consider as they watch the next generation of wireless technology come BEFORE of age in Seattle.

That city became the starting point in GPRS's rollout across the U.S. in

launched the service to business users. A month later Cingular Wireless rolled out the technology to consumers. In late September, both AT&T Wireless and Cingular Wireless provided M-Business with an opportunity to try the new service. Since then, both carriers have added more cities in eight states, while VoiceStream debuted service in 38 states in mid-November. Our field test showed that users buying into GPRS now can indeed expect higher speeds, but they face rationing in the amount of data they can download, and they have only one choice of handset. Gartner analyst Ken Dulaney says that the more important aspect of the Seattle rollouts is not what users get but what AT&T Wireless and Cingular get: a chance to hone their technology and billing plans for

July, when AT&T Wireless

#### WHAT USERS GET FROM GPRS

the higher-stakes national market.

For users, the value of jumping into GPRS remains unclear. The carriers have yet to announce when users can expect new services designed for the always-on connec-

tion. And Iane Zweig, an analyst with the Shosteck Group, questions whether the quicker connections will continue as more people start using the networks.

Two kinds of faster speed. The carriers say a key selling point of GPRS is the improved data speeds that reduce the often minutes-long wait for Web-based pages to download onto mobile phones. In the Seattle area, accessing news, sports scores, and movie times was quicker over the new networks than over 2G networks, according to people who've used both. M-Business found the same to be true in our tests.

How those transmission speeds will fare as more people start using the networks is

unclear. Shosteck analyst Zweig points out that despite the carriers' claims, recent independent tests of British Telecom's European GPRS network showed real-world data rates of only 8Kbps, slower than the 2G

networks' 9.6Kbps. The ultimate speed of downloads depends on both network resources and the handset. In Seattle we were doing our tests in September - only two months after the networks had rolled out - so we were sharing the network with very few users, perhaps making our experience better than average.

Whatever the data-transmission speed, efficiency increases with an always-on connection that provides instant connectivity to data, says Zweig. Dulanev agrees,

over dial-up modems in the wireline world.

Data by the byte. Prices for the GPRS services are roughly comparable to those of 2G networks, and each company offers users a set volume of data downloads per month. AT&T and VoiceStream give phone users 1MB per month, while Cingular offers 500K. Reading the home page of a news site will burn an estimated 75K. while a three-paragraph email uses about

25K. This data rationing keeps traffic on the still-new networks at a manageable level, though both companies let users pay on a per-kilobyte basis for more than the standard allotment.

AT&T spokesman Mike

Broom says that 1MB is enough to accommodate a monthly use of handset applications. But the company does plan to roll out optional add-on plans that provide enterprise users doing more data-intensive laptop applications with an additional 5MB for \$30 and 40MB for \$100, while VoiceStream is selling 1MB increments for \$10 for phone users, \$5 for PDA users, and \$4 for laptop

AT&T and Cingular, and the \$170 Timeport P280 and \$100 Timeport T193. Nokia has promised a GPRS phone in early 2002, but neither AT&T nor Cingular gave an indication of when they expect additional phone models to go on sale alongside the Motorola. The situation is not much better in Europe: There, too, just a handful of GPRS phones are available.

Scott Ellison, an analyst with International Data Corp. (IDC), says the



#### What GPRS Carriers Charge in Seattle

AT&T and Cinqular offer customers different service and pricing models

	AT&T Wireless	Cingular Wireless
Coverage Area (same as 2G)	Seattle, Spokane, Portland, Las Vegas, and Phoenix	Seattle and Spokane
Services (same as 2G)	Always-on email access with response capability	Always-on email access with response and original composition capability
Speeds	30Kbps-44Kbps	10Kbps upload; 20Kbps download
Handsets	Motorola Timeport P7389i: Suggested retail price is \$299, but M-Business found it in stores for \$353	Motorola Timeport P7389i: \$299
Basic Monthly Rate Plan	\$49.99 for 400 voice minutes and 1MB of data, 3/4¢ (\$0.0075) per additional kilobyte	\$14.99 for 500K and 100 text messages (the data charge is in addition to voice fees)

For more on Europe's 2.5G

deployments, see "GPRS"

July 2001 M-Business ---

www.mbusinessdaily.com/

jul/gprs

Cautious European Debut,"

\*Different data rates result from different network configurations and channels allotted to data.

saying that in addition to delivering email automatically, a packet-switched network can provide a quicker response to a data request even without faster transmissions. That's because there's no need for the wireless equivalent of dial-up: It's the same advantage that DSL and cable modems have

users. (Cingular has no plans for data addon bundle options.)

Limited connections. Users in the U.S. have a limited choice of hardware to access a 2.5G network. Motorola has the only commercially available GPRS devices: The \$299 Timeport P7389i used by

> january 2002 business 35

AFTER

data in terms of both speed and volume will come from enterprise users equipped with laptops. That's why AT&T wants its suppliers to deliver adapters that will connect laptops to the network. Until then, AT&T plans to have serial connectors that link laptops to GPRS phones. The company would not provide dates for the availability of either the adapter or the serial connector. VoiceStream has a similar strategy to connect its phones to PDAs and laptops.

Few new services. Higher speeds or no, the new phone and new networks currently have little to offer in the way of new services for businesses or consumers. Cingular is hoping that consumers will be attracted to the higher speeds and the pay-per-use billing model that packetswitched networks more easily allow. Dave Williams, Cingular's vice president of strategic planning, offers no indication of when or even if new consumer services specific to GPRS are likely to appear. And while new services for enterprises are planned, they won't be made available until Cingular has a network adapter available for laptops, he says.

Likewise, Broom says that AT&T is

working with some of its traditional application partners to develop GPRS enterprise services such as corporate email access that allows file downloads. When asked who might use such a service, Broom named the King County traffic department (Seattle is the county seat), which is already using the 2.5G network to check image feeds from cameras placed around city streets.

More typical is another AT&T enterprise customer, RealNetworks, which extended its existing corporate cell phone program to the new GPRS phone. One employee told M-Business that he uses the new phone to access the same services he used over AT&T's PocketNet data service. He says accessing the Web is quicker with GPRS and the always-on connection to email is a big advantage. But as with the previous 2G service, he cannot download files attached to email or access the address book or other features housed on the RealNetworks' intranet because there are no applications or services that permit it. However, he set up his account to forward email to his phone and receives those messages in much the same way that users of

the Research in Motion BlackBerry service receive theirs.

AT&T's Broom says applications that provide access to corporate data, including full email services, are under development with partners, but he did not give rollout dates. Cingular's Williams is also vague about 2.5G-specific application plans, saying the immediate focus is on simple enterprise data access.

#### WHAT THE CARRIERS GET FROM GPRS

In contrast to AT&T's and Cingular's limited initial deployments, Sprint PCS and Verizon Wireless plan to launch their CDMA2000-based 3G Lite services in two dozen large cities simultaneously next year. Should AT&T Wireless and Cingular be criticized? Analysts say the carriers are in a difficult position whether they choose to roll out their services in small regional stages or all at once, because compelling services depend on first having a working network in place. IDC's Ellison says a lack of new services in the early rollouts is expected and that carriers had a choice of waiting until they had GPRS and a host of new services in the top 25 markets before opening the networks to users, or doing it one step at a time. And even the CDMA carriers aren't yet talking about what type of service they'll offer over their new networks.

Although Ellison says that rolling out services piecemeal can lead users to think that GPRS is not quite ready for prime time, he notes that AT&T and Cingular do get a chance to better understand how the technology runs and what pricing plans will work before a national audience comes online. Shosteck's Zweig agrees but adds that the restricted rollout — and the technology's current limits — mean the carriers face a potential backlash if they overpromote GPRS.

While the early networks provide a testing ground for carriers, Gartner's Dulaney points out that it will be months before users of the new networks see new capabilities. Until then, users will likely find it difficult to justify paying for the new equipment and data access prices.

- Sean Yokomizo

### Seattle Is Just the Start

AT&T, Cingular, and VoiceStream are looking beyond the Pacific Northwest

wo of the three U.S. carriers offering General Packet Radio Service (GPRS) — AT&T Wireless and Cingular Wireless — put their initial GPRS coverage over the same footprint as their 2G data services: in the Seattle and Spokane, Wash., areas. Why the coincidence of two carriers deploying in the same state? AT&T Wireless has been headquartered in the Seattle area ever since its predecessor, McCaw Communications, was founded there in the 1980s. Cingular, on the other hand, has few users in the area; it's hoping to use GPRS to differentiate itself from the likes of Verizon Wireless and Sprint PCS and win a stronger claim on the local market.

But the two carriers haven't stopped in Seattle. In October, AT&T expanded its GPRS services to include both business and consumer users in Portland, Ore.; Phoenix; Las Vegas; Detroit, Flint, and Ann Arbor, Mich.; and Toledo, Ohio. Service is expected in Florida by January 2002. At the same time, Cingular announced it would launch GPRS in Las Vegas, the Carolinas, eastern Tennessee, and coastal Georgia.

VoiceStream in mid-November debuted its iStream GPRS service simultane-

VoiceStream in mid-November debuted its iStream GPRS service simulta ously in 38 states. Unlike AT&T and Cingular, it already had a GSM network on which to add GPRS services, making a national rollout easier (GPRS is a GSM-based technology). AT&T and Cingular are converting their systems from TDMA to GSM/GPRS.

policy

# The Spectrum Caps Are Gone. Now What?

### FCC decision may accelerate data services, reduce choice in smaller markets

t's a classic good news, bad news story. On Nov. 8, the Federal Communications Commission eliminated restrictions on wireless spectrum ownership in rural areas, raised the limit on ownership in urban areas, and promised to eliminate all caps completely on Jan. 1, 2003. The decision drives home a message that FCC chairman Michael Powell has been sending since he was appointed by the Bush administration: Whatever happens to the wireless industry should be the result of market forces rather than guidance from FCC policies. "The FCC is pulling back from an activist strategy," says Michael Doherty, an analyst with market research firm Ovum.

The elimination of spectrum caps is a clear victory for large wireless carriers, which will now be free to acquire more spectrum licenses. What does it mean for the rest of the wireless industry? For them, the good news is that the decision opens the door for industry consolidation. The bad news is, well, that the decision opens the door for industry consolidation.

In the short term, most observers agree that the FCC's decision will encourage the continued rollout of data services in the U.S. Acquiring more spectrum is simple compared to figuring out how to iam more voice and data subscribers into a fixed amount of bandwidth. The bad news could appear in two or three years as the top carriers continue to acquire spectrum licenses and buy up second- and third-tier carriers. If left unchecked, such consolidation could leave some markets with only three carriers, or even two, which might lead to reduced competition - and fewer choices for anyone in the market for wireless services.

#### EASING UP ON THE REINS

The debate about spectrum caps is really a debate about competition. In 1994, when the FCC moved to increase the spectrum available for mobile services, it created the caps to prevent the existing players (or the companies the players controlled) from snapping up the newly available spectrum licenses. Over the years the basic policy remained the same: Ownership and control of the wireless spectrum was limited to 45MHz in urban areas and 55MHz in rural areas (in the less-dense rural markets carriers need more spectrum to achieve the same economies of scale). With 180MHz of spectrum available for mobile services in any given geographic area, the caps practically ensured a minimum of four service providers - striking a balance between the carriers' need to aggregate spectrum to provide service and the FCC's desire to promote competition.

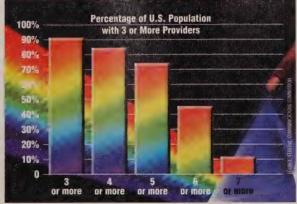
The caps withstood challenges during routine regulatory reviews in 1996 and

1998, and many of the arguments raised during the 2001 review were similar to those of previous years. Some smaller carriers and several consumer groups argued against lifting the caps, warning that the result would be industry consolidation and spectrum hoarding by incumbents, reducing competition and therefore innovation. But most carriers argued in favor of lifting the caps, saying they needed more spectrum to expand services and to support the growing number of wireless users.

This time, cap opponents had extra ammunition: European carriers were bidding spectacular sums of money for great swaths of spectrum ear-

#### **Enforcing Wireless Choice**

One could fairly argue that the FCC's soon-to-be-eliminated spectrum caps have created a highly competitive market for wireless services. Three-quarters of the potential consumers in the U.S. can choose from five or more carriers; almost half have six or more choices.



marked for third-generation (3G) services, and there was a general feeling that unless the U.S. provided the same amount of spectrum, it would fall behind technologically.

Politically, it was clear that the climate at the FCC was changing and the smart money was on the caps coming off. The agency had taken heat from Republican leaders on Capitol Hill for years for what they viewed as the FCC's heavy-handed approach to the market. The pressure to remove the caps only increased as the year went on.

By fall, two of the FCC's recent attempts at broad policymaking had blown up in its face. First, the reauction of spectrum licenses previously won by NextWave - a situation created when the FCC tried to make room for smaller, independent players -

For more on Powell's

appointment, see "Washing-

ton's Wireless Quagmire.

May 2001 M-Business -

may/quagmire

nov/e911

www.mbusinessdaily.com/

vices: Stood Up," November

www.mbusinessdaily.com/

For more on the Next-

2001 M-Business ---

Wave controversy, see

Spectrum," April 2001

M-Business --- www.

mbusinessdaily.com/

"Proxy Spat Could Delay

For more on the E911 issue, see "Location Ser-

degenerated into a morass of MORE IN M-BUSINESS court challenges and accusations of rule-bending.

And in October, the FCC gave carriers deadline extensions for its E911 program, having been forced to admit that it had underestimated the technology advances necessary to implement the automatic location of emergency wireless calls.

#### THE GOOD NEWS

The difficulty with analyzing the debate over caps is that much of the evidence on both sides of the argument is disputed. For

instance, many carriers claim they need more spectrum simply to support existing or near-term voice and data services (leaving aside any question of 3G). "We've got products that we can't put in now," says Brian O'Connor, vice president of regulatory and legislative affairs at VoiceStream. But none of the carriers will provide any specific statistics on the state of their networks.

Nevertheless, industry observers generally agree that network resources are being strained in high-density markets; most quote New York and Los Angeles as examples. "There are markets that are tapped out or close to it," says Mark Morell, director of market positioning for carrier



equipment maker Nortel. To get more use out of the existing spectrum, carriers have to shrink cell sizes by putting up new antennas, an increasingly expensive proposition as the market grows denser, he says. Ken Hyers, an analyst for Cahners In-Stat

> Group, agrees that retaining the caps would have hurt the carriers' expansion plans. Kevin Maroni, a partner at Spectrum Equity Investors, which invests in wireless services and infrastructure. points to the \$16 billion spent on the NextWave licenses as proof of the carriers' state of mind: "These guys need more spectrum."

The upshot for businesses that depend on the wireless industry should be positive. "You're going to get increased data services." says Cahners' Hyers, adding that opportunities will also increase

for companies selling hardware and services to carriers. Ovum's Doherty agrees: "This eliminates limitations."

#### THE POSSIBLE BAD NEWS

The possible downside to the FCC decision is reduced competition. The ruling doesn't magically create new spectrum licenses carriers will have to acquire them through purchases from, acquisitions of, or mergers with other carriers. Industry observers don't expect any immediate major moves, thanks to the depressed economy and the retention of some caps until 2003. But everyone agrees that the industry is going to consolidate. "We've got half a dozen national carriers, and the market won't support that," says Hyers. Second-tier players like Alltel and even Nextel will become acquisition or merger prospects.

Consolidation could be beneficial to businesses purchasing wireless services from carriers, as it would let carriers fill gaps in their nationwide coverage. "The big players will go for places where they have shortages," says Giga Information Group analyst Brownlee Thomas, In addition to providing service over a wider area. larger national networks benefit carriers. because it's expensive to serve a customer roaming on a competitor's network.

The danger comes as the number of competitors starts dropping within local markets. "When you go from five competitors to four or three or two, at what point do you say that's anticompetitive?" asks Peter Cramton, professor of economics at the University of Maryland.

Cramton is especially concerned about the possibility of nominally national carriers effectively carving the country up into geographic areas of dominance in much the same way that he says the national airlines have. "Competition and innovation doesn't come from United Airlines competing with American Airlines. Their incentive is not to engage in price competition they leave each other alone. Competition comes from an upstart like Southwest coming in from the bottom."

Despite assurances from the FCC that it will watch competition closely, nobody can definitively predict how consolidation will affect the wireless industry over the long term. Further, the spectrum-cap decision doesn't solve the larger problem of where additional spectrum for 3G services is going to come from. However, "lifting the spectrum caps may mitigate the urgency around allocating 3G spectrum," says Barney Dewey, an analyst with the Andrew Seybold Group.

In other words, if easing the spectrum rules encourages the continued rollout of data services, the FCC may have bought itself time to figure out what to do about 3G. At least for the short term, the FCC has given the larger carriers - and the wireless industry - room to breathe. III

- Cameron Crottv



business model

# Lessons from MobileStar's Demise

■ High payouts and poor revenue made the necessary cash flow impossible

obileStar looked like it was on the rise. It had an aggressive rollout plan and high-profile partners, including Starbucks and American Airlines. The company was a strong promoter of wireless hot spots that provide high-speed access over 802.11b networks in high-traffic public areas. In April, MobileStar announced that it had hired IBM to install networks in 2,000 hotels. airports, coffee shops, and other locations by the end of the year. But in November. VoiceStream announced plans to purchase the company's assets, which were on the block as part of Chapter 11 bankruptcy proceedings. (Voice-Stream would disclose neither how much it paid, whether it would continue to build the thousand or so planned but

undeployed hot spots, nor how the fixed wireless network would fit into its existing GSM network. At press time, the deal was still facing approval by the bankruptcy court, and VoiceStream spokeswoman Kim Thompson says the carrier couldn't comment on its plans or offer.)

Strategis Group analyst Naqi Jaffery says he was rooting for MobileStar as it built its network of hot spots. MobileStar's plan to put 802.11b-based wireless networks in more public places,

he says, would have made fast wireless data available to mainstream users. Investors, however, were put off by the high deployment costs and expensive location deals that were the foundation of Mobile-Star's deployment plan. All of the company's partners and its former competitor, Wayport, say they are still committed to the hot spots concept. But Gartner analyst Ken Dulaney says MobileStar's demise is a blow to the growth of widespread high-speed wireless data networks except for those

supported by companies with deep pockets.

Primary targets for public hot spots are the hotels and airports frequented by business travelers already likely to own the needed 802.11b network adapters for

their laptops or PDAs. Both MobileStar and Wayport have networks in the nation's largest airports and in several hundred hotels. (Although MobileStar has eliminated almost all of its staff and a bankruptcy judge is considering a sale of its assets to VoiceStream, its network continues to be operational. There are reports of scattered outages, however.) And both share the fees paid by users with the companies that own the locations. Wayport operates about 420 networks, mostly in chain hotels such as Four Seasons and Wyndham International. MobileStar has deals in place to provide networks in about 100 Hilton hotels and 31 American Airlines frequent-flyer lounges, although it's unclear if they are now likely to be fulfilled.

MobileStar took a more aggressive approach than Wayport by rolling out networks in the more mainstream environment of Starbucks coffee shops, offering users an Internet connection through Microsoft's MSN service. Before its de facto cessation as a company, MobileStar had installed networks in nearly 500 Starbucks cafés and planned to install more by the end of 2001. None of the companies involved in MobileStar's rollout would discuss how the deal was structured or even if Microsoft was paying to have MSN as the initial portal for Starbucks customers. But Yankee Group analyst Roger Entner says that it's likely that MobileStar paid for the Starbucks installation as it had for the rest of its deployments. And therein lies what has all but extinguished MobileStar.

#### HIGH-COST, LOW-REVENUE PARTNERSHIPS

Gartner's Dulaney says the resourceintensive commitments in Mobile-Star's deals prevented the company from getting additional financing, leaving the company with the double whammy of high capital costs and insufficient funds to keep going. The broad rollout of any data network faces a resource problem, says Dulaney. It's a familiar problem in wireless: Nobody wants wireless unless they can count on it everywhere, but companies need lots of users to underwrite the costs of rolling it out everywhere.

MobileStar's partners wouldn't reveal network installation costs, and Wayport vice president of marketing

#### MobileStar

Deployed and operated 802.11b networks in public venues.

Web site: www.mobilestar.com

**Location:** Richardson, Texas **Founded:** December 1996

Ceased most operations: October 2001

Assets acquired: November 2001,

by VoiceStream

**Funding:** \$55 million (lead investors Mayfield Fund, Blueprint Ventures, and Norwest

Venture)

Employees: 85 before declaring bankruptcy

Dan Lowden says that the costs vary too much between locations to provide an average price for installing a wireless network. However, Jupiter Media Metrix analyst Dylan Brooks says equipment and other installation costs can run as high as \$30,000 per location. Before it all but ceased operations in October, MobileStar had deployed about 550 hot spots.

MobileStar paid for the hardware installed in each of its several hundred network locations, and its aggressive push to add 2,000 new networks in 2001 made the costs soar. The company also paid to maintain the T1 lines that connected its wireless networks to the Internet, which Dulaney estimates at \$400 per month per location. Giga Information Group analyst Stan Schatt says that, most likely, some of MobileStar's location partners let the com-

pany piggyback on existing T1 connections. But the company was still probably paying maintenance fees for all of its airport and most of its hotel networks. Schatt also points out that while the per-location network costs don't seem high, the number of locations multiplied those costs into a crushing burden.

Aggravating the company's high costs were the revenue-sharing agreements it signed with its location partners, says Yankee Group analyst Roberta Wiggins. MobileStar CEO Robert Kaiser told M-Business in a July interview that the company was splitting revenues evenly with American Airlines. But none of MobileStar's location partners were paying for its network presence. That business model left MobileStar trying to attract venture capital despite having high capital costs and a restricted revenue stream, says Wiggins.

#### A BLOW TO THE HOT SPOT CONCEPT?

In spite of new support for the hot spot concept from VoiceStream in its acquisition of MobileStar's assets, MobileStar's demise highlights the lack of a profitable business model in the hot spot industry, says Schatt. And the message is not lost on its competitor, Wayport, which is itself seeking another round of financing. Way-

> port is working to recast its business model by changing the structure of its location deals.

Wayport's Lowden says that all of the location partners signed over the last six months have agreed to pay the infrastructure installation costs and take a smaller share of revenues. Wayport is also working to renegotiate existing deals along the same lines. But despite Wayport's renegotiations and its mix of wired and wireless networks, Schatt says the company faces a long road to profitability without enough access points to create habitual users. Even if Wayport does turn a profit, the large capital costs and as yet nascent user base threaten to keep hot spots confined to niche locations where users are willing to pay for the service, says Yankee's Entner.

#### **Big Names, Bad Deals**

The table below lists MobileStar's biggest customers, along with an estimate of how much it cost to deploy the sites. Because MobileStar provided its networks as a service, and because it received only shared revenue and did not also share the costs, investors turned up their noses at another round of funding. Using Jupiter Media Metrix analyst Dylan Brooks' high-end figure of \$30,000 to outfit a hotel's public space — and halving it for airline lounges and coffeehouses, you still get an estimated outlay of more than \$10 million for MobileStar's networks.

That's a lot of coffee and layovers.

Hilton \$3 million (about 100 hotels at \$30,000 each)

American Airlines \$465,000 (31 lounges at \$15,000 each)

Starbucks \$6.8 million (about 450 cafes at \$15,000 each)

\$10.2 million

Total

business january 2002

Internet World Wireless is the premiere wireless event in the country for senior enterprise executives, wireless service providers and carriers who are interested in the opportunities provided by wireless technologies. As the demand for cutting-edge wireless technologies increases, Internet World Wireless East 2002 provides an educational and business forum where professionals can explore new wireless Internet business applications, systems and solutions.

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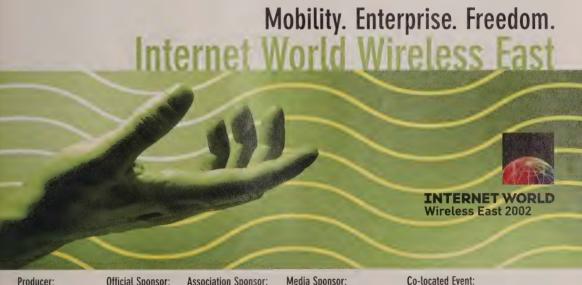
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Not all analysts forecast gloom, however. Gartner analyst Leslie Fiering is much more bullish on the hot spot concept. She says MobileStar's failure will not slow the growth of public wireless LANs, which she estimates will grow to 38,000 locations worldwide by 2006, with 64% of those deployed in North America. She cites two reasons for such projections:

• Wireless LAN users have already demonstrated productivity gains in airports, where users waiting for flights can

# Airport hot spots have opened a revenue stream waiting to be tapped.

work over high-speed Internet connections. That shows there is a revenue stream to be tapped.

• Thanks to MobileStar's network spending spree, some of the initial capital investment is already in place. There's a very real possibility that VoiceStream purchased MobileStar's assets at prices low enough to make a profit. The deal may resemble the demise and resurrection, at a discount, of satellite phone provider Iridum, which spent more than \$4 billion to launch a fleet of satellites later purchased by an investment group for \$24 million, or the recent sale of the \$1 billion Metricom Ricochet network for \$8.3 million.

Jaffery acknowledges the potential of hot spots as an adjunct to VoiceStream's next-generation data services. And so does Giga's Schatt. However, even the network's likely new owner faces challenges from the need to build out enough access points to make the concept usable. Schatt says that an important part of any company's strategy in rolling out hot spots is forging roaming agreements between other operators, just as the cell industry did: One company wouldn't have to bear the capital costs of universal deployment, and the number of usable access points could be enough to draw a sustainable number of subscribers.

Sean Yokomizo

### policy

# Icon Thieves Loot Image-Rich Web

Europe's mobile content world is riddled with piracy, and it may get worse before it gets better

hen Panu Parviainen visits Web sites that sell mobile icons — small graphics used to decorate cell phone screens and messages — he can't help but get angry at what he sees. In front of him are images that his company has created, but none of them have been licensed to the Web sites. Parviainen is the cofounder of Finland-based Wireless Entertainment Services (WES), which develops and sells ringtones and icons to 35 carriers in Europe, Asia, and Latin America. He says that the third-party sales of his

company's

material without permission constitutes theft. But the theft is so rampant, the laws still so largely untested, and the legal fees so high that he says he has little choice but to let it pass.

Parviainen is not alone. U.K. ringtone and icon vendor Mobile Flirting has issued numerous warning letters to competitors asking them to remove illegally reproduced images from their sites. Mobile game developer Springtoys discovered that a competitor had replicated some of its gaming characters and scenarios and was attempting to sell the copied game to a carrier. Mike Buckland, managing director of mobile icon vendor GR8, says that theft is common among the hun-

dreds of European sites that sell icons and ringtones. In addition to stealing from each other, many of the Web sites offer trademarked images from Hollywood films, cartoons, and popular companies, none of which have been properly licensed. Companies as diverse as Lucasfilm, Nokia, and Disney have all found pirated copies of their images for sale as mobile icons.

While icons are just beginning to appear in the U.S. market, they are a mainstay of European mobile content; currently only available for Nokia's Smart Messaging system, icons will become more common now that Nokia's Enhanced Message Service (EMS), which supports richer text display,

For more on ringtones, see

October 2001 M-Business

www.mbusinessdailv.com/

"Is Nokia Threatening Mes-

saging's Future?" October

www.businessdaily.com/

2001 M-Business ---

oct/ringtones For more on EMS, see

"Ringtones Are Music to Content Providers' Ears,"

is available in Europe. Most MORE IN M-BUSINESS companies that sell icons also sell ringtones. They're both cheap (about \$1.50 to \$4 apiece) and popular with young users who enjoy personalizing their cell phones. While ringtones give phones a unique trill, icons decorate screens and give messages a personalized touch (such as graphics of pizza or oct/ems.

beer as shorthand for getting a meal). Danish consulting firm Strand Consult estimates that the icon market alone will have brought in \$700 million this past year.

Companies that hope to build a business on mobile content are concerned about icon vendors operating without regard for copyright; in it they see a potential replay of the copyright problems that have plagued Web-based publishers. Dave Powell, CEO of Copyright Control Services, which helps companies address piracy on the Internet, says that Web-based piracy is rampant and can easily spread to the mobile market, particularly as high-speed networks increase the speed of mobile content downloads. Without a system to ensure that copyrights - as well as trademarks, which cover broader territory - are honored, the mobile content business is threatened, says Simon Buckingham, CEO of consultancy Mobile Streams.

Features embedded in the EMS standard can stop the copying and forwarding of images. And some companies are working on digital rights management products that will make it tougher for individuals and companies alike to copy content. Those technologies may provide a long-term solution, but ultimately, copyright violation will stop only if content companies clamp down on infringement before it gets worse.

#### THE BURDEN OF PERMISSION

Because of today's low-bandwidth networks and monochrome displays, mobile icons are simple black-and-white images that can be copied in as little as 10 minutes, says GR8's Buckland. He adds that images are often just cut and pasted from one company's site to another.

Some companies say they sell content illegally simply because no one has stopped them from doing so. For example, Katrin Schultz, a spokeswoman for icon vendor Logoland.com, savs that Logoland sends letters to companies seeking permission to use their images as icons. When companies forbid the use of their images, Logoland stops

selling them, says Schultz. But when Logoland wrote to Nokia, it heard nothing back, so the company has kept Nokia images on its site. Nokia, however, sees this as trademark infringement (although it's only recently found out about the infringement and doesn't yet have plans to go after the violators). GR8 also posted a Nike icon on its icon site before asking Nike's permission, says Buckland. Once Nike refused permission, GR8 removed the icon.

Regardless of any efforts that companies make to obtain permission, they are violating trademark or copyright law if they use images without consent, says Arto Linnervuo, an attorney with Finnish law firm Opplex, which represents Parviainen's company, WES. But today the mobile icon market is so small that violations go unnoticed by copyright holders and the market generally goes unregulated, says Strand Consult CEO John Strand.

#### **LEGAL UNCERTAINTIES**

There is no case law that pertains specifically to mobile copyright, says Markku Pulkkinen, legal counsel for Finnish carrier Radiolinja. He says there is even doubt about the extent to which icons are covered by copyright law, since they are such simple images. Copyright protects an artistic creation from unauthorized reproduction and sale. But Linnervuo says that if icon copyright cases ever do go to court, only exact replications of the simple pixilated images will be considered in violation.

All this has created a lawless environment and has left many companies fearful. Parviainen says that WES creates all of its

# Icon Filchers: Caught!

Pilferers swipe art for commerce' sake

ith the mobile icon market worth about \$700 million this year (according to Strand Consult), it's worth a company's while to protect its product. The images most commonly targeted by pirates are movie logos, cartoon characters, and company logos, but every-

thing's fair game. For example: Finnish mobile

gaming company Springtoys has had game characters like the one at left stolen and resold as mobile icons. Finnish icon vendor Wireless En-

tertainment Services has found the above-right icon, which it created for sale without its permission on competitors' Web sites. And

U.K. icon vendor

Mobile Flirting issues warning letters when it finds its icons, such as the one below, on copyright violators' Web sites.



own icons in part because it worries that if it licenses trademarked material, it will be responsible if that material is stolen. Springtoys COO Juhapekka Ristola says that his company has taken a similar approach for now. But Ristola is concerned about the future: He foresees an increasing demand for branded content, such as Spiderman or Batman games and images, and he thinks the market may be stifled if copyright infringement is not addressed.

As networks and handsets improve to handle higher data rates, copyright issues are likely to become more clear-cut because images will be more detailed. And as images become more valuable and mobile content becomes more mainstream, large copyright holders such as Disney and AOL Time Warner are likely to get aggressive about defending their intellectual property in the wireless realm, Pulkkinen says.

Copyright law covers exact copies, but trademarking images will always provide more protection, Linnervuo says. A trademark applies to a broad range of likenesses, including low-resolution icons. Springtoys' Ristola agrees that trademarking is necessary in today's mobile content market; Springtoys trademarks many of its game characters.

#### TECHNICAL SOLUTIONS

While the law is still murky and enforcement is minimal, companies that anticipate a growing market for wireless content are already beginning to consider technological approaches to prevent users and competitors from illegally reproducing wireless content. EMS, which made its European debut this fall, includes security technology that allows content creators to prohibit users from forwarding images to friends. The messaging standard also incorporates security that makes it difficult for companies to copy images from mobile phones. EMS chipmaker Magic4 included those compatibilities in the EMS standard because the company anticipated a growing market for mobile icons and the need to control copyrighted material, says Adrian Atwood, Magic4's COO.

Although standards for the next generation of messaging – Multimedia Message

## Some encryption systems allow only the user who has paid for the content to access it.

Service – are still being worked out, MMS will also have encryption-based digital rights management software included both in handsets and at the carrier level, says Magic4 product manager Alex Linde. That will ensure images are controlled by sellers and potential pirates will find it harder to copy and redistribute material.

Several companies working on Internet digital rights management are adapting their technology for the mobile market, including InterTrust and Digital World Services. Both companies have developed systems that let content providers encrypt

# The Legal Route for Mobile Icons

Copyrights and trademarks provide varying levels of rights protection for mobile content creators

#### COPYRIGHT

Copyright is the most basic level of rights protection, and it's automatically granted to all artistic creations. It protects against illegal reproductions of

an artist's work without permission. But since mobile icons are currently very simple images, the copyright may only apply to exact copies.

#### TRADEMARK

Trademarks give a much higher level of protection than copyrights do. A trademark applies to a broad range of likenesses of an image, and thus may be more applicable to the mobile environment. But getting a trademark requires much more work: A company must apply for a trademark and pay fees in each country where it wants protection.

content and allow only the user who has paid for the content to access it.

While those technologies will protect mobile content to some degree, Gartner analyst Mike McGuire points out that the encryption approach faces a few hurdles. First, encryption must be standardized. If every wireless company has a different encryption system, users will be forced to keep multiple clients on their devices, which may cause a level of complexity that users will reject because it will require too much effort to simply look at an image or send a ringtone. Mobile content providers are just starting to discuss standardization, so it may take years to agree on a standard.

Even if encryption is standardized, consumers may reject it. Powell says that the encryption approach treats consumers as if they are criminals and can turn people away from purchasing online digital content. Encryption also won't stop companies from illegally reproducing content; it will only stop them from physically copying it. Still, Mobile Streams' Buckingham says that as wireless technology advances and requires increasingly expensive content production, many copyright infringers will be eliminated. And as bigger copyright holders increase their market presence, they will start to flex their legal muscle.

In the meantime, mobile content companies must understand that protecting their copyrights is central to their business success. Digital rights management approaches are beginning to show up on the Web and are expected to be part of the next generation of wireless messaging. Those companies that hope to generate revenue from mobile content should keep an eye on which encryption methods work best on the desktop Internet and how they are being adapted for mobile. While it may not make sense now to pay employees to search the Web for icon pirates, businesses can send cease-and-desist letters when they come across violations, says Buckingham. And they can protect themselves best by trademarking images. The only way that mobile content world will be free of copyright infringement is if copyright owners understand and protect their rights.

- Jim Rendon

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M-Business (ISSN# 1532-3137) is published monthly by CMP Media LLC, 600 Harrison St., San Francisco, CA 94107, (415) 947-6212. Volume 2, Issue 1. Application to Mail at Periodicals Postage Rates is Pending at San Francisco, CA and at additional mailing offices. For subscription questions, change of address, and orders, call (800) 677-2452 (U.S.). For all other countries call (487) 647-0528 or fax (847) 647-0256. Post with to P.O. Dox 2046, Stokie, IL 60076 Please indicate M-Business on all orders seed letters to the editor via email to letters@mbusinessdaily.com, via fax to (415) 947-6029, or via mail to M-Business, Letters to the Editor, CMP Media, 600 Harrison St., San Francisco, CA 94107. On the Internet: Visit our Web site at www.mbusinessdaily.com. POSTMASTER: Send address changes to: M-Business, P.O. Box 2046, Skokie, IL 60076 Subscriptions: Publisher; to equalified U.S. recipients; all others \$42.95 (Canada and Mexico), \$82.95 (international). For reprints, call (800) 682-4972 ext. 7081. For back issues, call (800) 444-4881 or (785) 841-1631 (outside the U.S.), or email mbusiness@halldata.com.

# **Heavenly Wines Go Wireless**

Aureole, a restaurant in the Mandalay Bay hotel and casino in Las Vegas, is making the most of both wired and wireless technologies. The restaurant sports a four-story "wine tower." Two bottle-fetching "wine angels" are wired - like Tom Cruise in Mission Impossible. When an order comes, a wired harness vanks one of the women skyward to retrieve the requested wine.

Of course, getting yanked up four stories just to find that

there's no more of a certain vintage is no fun for even the best-tem-

pered angel, which is where the wireless part comes in: Customers view Wi-Fi-enabled Web tablets that present the extensive wine list - with tasting notes, winery profiles, and other information - and the wireless link keeps it instantly updated when a given vintage sells out during the evening. With hardware from

Sonic Blue and software from RedOctober, the customized eWine Book ensures a productive flight of angels.

"I'm a total tech geek," explains Andrew Vadjinia, who conceived the project for the restaurant and who has even more dynamic plans for wireless and Internet applications. "This is just the beginning." And you thought the chefs at Benihana were cool . . .

# **Mobile Games Get** Undigitized

There's a flow to the Information Age: Everything becomes digital, and then everything digital becomes small and wireless. That's progress. Except that some wireless games are causing such interest that they're reversing the flow. swimming upstream to become traditional board games.

Canadian game maker B.E. Game has licensed nine wireless games from Airborne Entertainment's PocketBoxOffice and plans to turn them into real-world, nondigital games: board games with good oldfashioned cardboard boards. B.E.'s Game Shelf Games will feature PocketBoxOffice's Half Truths, This or That, Odd One Out, and others.

So what's with this giant step backward? "Games are all about content," says B.E. Game cofounder Daniel Wilchesky. "Regardless of platform, a great game can always work on a variety of venues."

## **Cell Phones** Hide Undercover

A Motorola report on the behavior of mobile-phone users worldwide found that one in 10 maintains a secret second handset, often for clandestine love affairs. The first handset - the one whose number is given out to colleagues - is perhaps the one the user's spouse knows

about, while the second unit is reserved for those whispered communications.

> Motorola suggests that this is a sign of people embracing a new technology. We're not so sure about that, but clearly

there's embracing involved somewhere. Actual quote from the report: "'I'd like to turn off my mobile when I'm in bed with someone' said one businessman, many miles from home, but my wife suspects I'm being unfaithful if she can't reach me?"

## Cat Chow on the Go

This has happened to all of us at one time or another: You're out on the street, you're in a café, maybe you're on a train,

> and you realize you have a vital question regarding cat food, and no way to immediately answer it! Is dry or wet food better for a kitten? How much do

vou feed an "indoor cat"? Why don't cats need to brush their teeth?

Salvation has come. The forward-thinking, technologically hep cats at Ralston Purina have pounced on the wireless cat-fanatic market with Catchow.com to Go. the AvantGo-delivered wireless version of the Cat Chow Web site, easily one of the Internet's leading sites devoted to cat food. In addition to providing daily cat-care tips and a "Cat Care Library." the service proves once and for all that there are, in fact, some ideas just too silly for wireless. Unless they can answer the toothbrush guestion.



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